e Series | c Series

HybridTouch and Non-Touch Multifunctional Colour Displays

INNOVATION • QUALITY • TRUST

Raymarine®

WiFi CERTIFIED

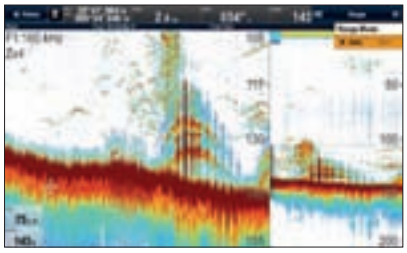
Bluetooth

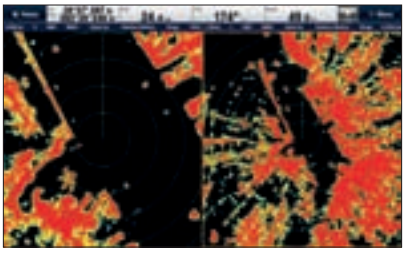
FUSION

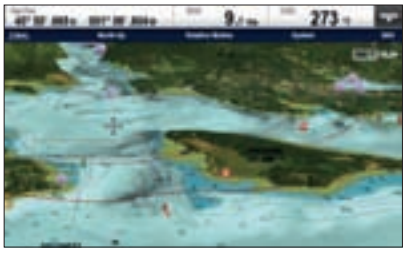
e Series and c Series. Good looking. Highly intelligent. Loves to network.

e and c Series multifunction displays (MFDs)
With a touch-screen interface backed up with easy-to-use controls and a whole host of features and connectivity, e Series displays are there for you – make them your own. c Series offers the same functionality in a non-touch package.

- Raymarine apps to view or take full control of your e or c Series MFDs via smartphone or tablet.
- Great connectivity – access information and music on the go and there's a handy remote control too (optional).
- HybridTouch™ and non-touch displays with dual-core processors and dedicated graphics power for no-compromise performance.







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Form and Function

e Series and c Series display's helm-friendly industrial design breaks away from box-like marine electronics, and offers a clean, unobtrusive display solution that looks great on any helm. A smart new shape for marine displays, the sleek, low-profile offers maximum display size with minimum footprint. The rugged, handsome design is complemented by flush, easy-press buttons and "hidden" memory card slots along the right hand side. An all new UniController offers precision control of the joystick cursor, rotary adjustments, and menu commands.

Available with or without Navionics Silver cartography and built-in ClearPulse Sonar.

LightHouse User Interface

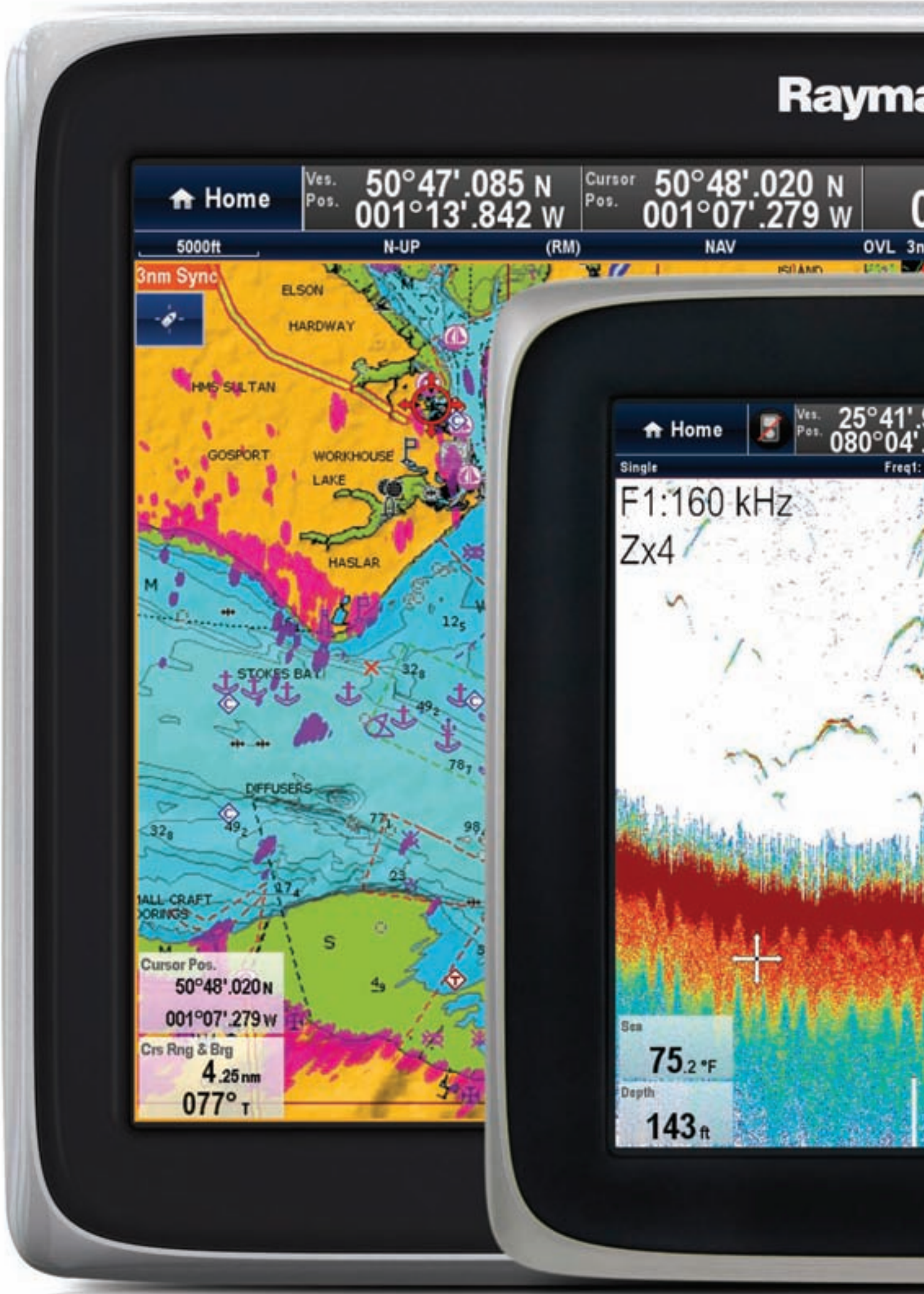
Designed for the way boaters think, Raymarine's exclusive LightHouse User Interface (UI), offers an incredibly easy-to-use navigation experience. LightHouse intuitively places frequently used navigation functions right at your fingertips. With LightHouse you will quickly become an expert, thanks to an easy-to-use home screen of all your new e and c Series apps and custom navigation pages. Just swipe the home screen left or right for immediate access to the entire library of new e and c Series capabilities.

LightHouse takes full advantage of Raymarine HybridTouch™ technology, giving you a choice between touch screen operation or full keypad control when seas are rough.

Extremely Fast (x3)

Powerful multitaskers, the e and c Series displays are equipped with three processors in the form of a dual-core main processor and a third dedicated graphics processor. Enjoy stunning graphics, brilliant video, and instantaneous chart redraws. This is marine processing power taken to a whole new level.

LightHouse
User Interface


Rayma
Home
Ves. Pos. 50°47'.085 N 001°13'.842 W
Cursor Pos. 50°48'.020 N 001°07'.279 W
5000ft
N-UP
(RM)
NAV
OVL 3n
3nm Sync
ELSON
HARDWAY
HMS SULTAN
GOSPORT
WORKHOUSE
LAKE
HASLAR
STOKES BAY
DIFFUSERS
Cursor Pos.
50°48'.020N
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Crs Rng & Brg
4.25nm
077° T
Home
Single
Freq1:
F1:160 kHz
Zx4
Sea
75.2 °F
Depth
143 ft

arine
00:06:30
Depth
77.2 ft
Radar
Menu
m
20082
HM
N-UP
RM
RR
1/2nm
Home
Menu
Raymarine
964 N
946 W
SOG
2.6 Kts
COG
054° T
Depth
143
Range
160 kHz-Man W
Freq2: None
Range Mode:
Raymarine
Touch Lock
My Data
Chart
Fishfinder
Switch Panel
Thermal Camera
GPS
Pilot
hybrid

15.4" e165

Features

- e Series: 7.0", 9.0", 12.1" or 15.4" sunlight viewable LCD MFDs
- c Series: 9.0" and 12.1" sunlight viewable LCD MFDs
- LED backlighting
- Built-in high-sensitivity GPS receiver (except e165)
- Optional built-in ClearPulse sonar (except e165)
- Available with or without Navionics Silver ready-to-navigate charts on microSD card
- Wi-Fi video streaming and waypoint syncing with smartphone and tablet mobile devices
- Bluetooth connectivity for optional RCU-3 remote control and multimedia control
- LightHouse user interface is extremely intuitive and places commonly used features and functions where they are easily accessed
- Dual-core main processor and dedicated graphics co-processor for amazing speed and performance
- Composite video and IP video input for marine camera, thermal imager or entertainment source
- Expandable networking up to 6 displays using SeaTalk^{hs} networking
- Mix and match any combination of new c or e Series displays
- Works with Raymarine radar, ClearPulse sonar, thermal night vision cameras, AIS receivers, instruments, autopilots and more

12.1" e125/e127

Personalise

Create custom navigation pages by dragging and dropping applications to the desired location on the page. The LightHouse user interface also guides you through setup and configuration with an easy to use start up wizard.

LightHouse is an expanding user interface with downloadable updates every 3 months. Make sure you are up to date with latest features available from **www.raymarine.com**/Service and Support/Raymarine Software Updates.

9" e95/e97

7" e7/e7D

GPS Chartplotter

e Series and c Series displays are ready-to-navigate with a built-in high sensitivity 50 channel DGPS sensor (except e165) utilising WAAS, EGNOS, MSAS plus Navionics Silver charts on a supplied microSD card (when purchased with charts). Experience rich chart graphics and 3D textures along with super-fast screen redraws using Navionics Platinum cartography (sold separately) and TurboView technology. A new Easy View mode enlarges chart text, spot soundings and icons on every range scale for distance viewing.

Radar

Network e and c Series displays to Raymarine radome radar antennas for unsurpassed clarity and target detection. HD Color signal processing technology delivers superior long and short range target detection, including Raymarine's exclusive Bird Mode target tracking. Bird Mode tracks flocks of seabirds, giving fishermen the information they need to locate schools of fish. Navigate with radar directly from the chartplotter application using radar overlay or activate Dual Range mode for both short range and long range radar view (HD only).

ClearPulse Sonar

c and e Series sonar versions feature a built-in dual frequency ClearPulse sonar capable of depths down to 3,000 feet. The sonar versions target fish and depict structures with amazing clarity. The intelligent ClearPulse sonar automatically adapts and adjusts for a clear image of fish and bottom contours without any complicated controls.

Trolling motor ready. Connect the new c and e Series sonar versions (e7D/e97/e127/c97/c127) to optional thru-hull, in-hull, or transom transducers. Bass anglers can take advantage of Minn Kota's Universal Sonar trolling motor transducer using an optional sonar version transducer adapter cable.

Thermal Night Vision

The e and c Series displays and T Series cameras allow you to navigate safely and confidently seeing obstructions, buoys, and other vessels in total darkness. Take the stress out of night time navigation with the e and c Series displays thermal camera controls and access thermal images alongside radar or chartplotting applications.

RCU-3 Remote control

Stay in command of e and c Series displays without letting go of the wheel. The optional RCU-3 Steering Wheel Remote gives you simple access from the steering wheel to frequently used functions while underway. Change range scales, control your music, switch between apps and even mark a waypoint.

Bluetooth

Remotely control music functions on your Bluetooth phone (using AVRCP 1.2 or above) or tablet. Simply connect your Bluetooth phone/tablet to the vessel's audio system with a dock or auxiliary cable and stow it in a safe place. Next, pair to your device using the e and c Series MFDs built-in Bluetooth technology. Play and pause tracks, skip forwards and backwards in your play list, all from your display.

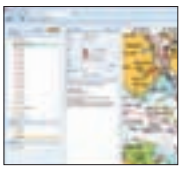
Fusion Audio

Fusion Marine Stereo home screen access. Full control of Fusion 700 Series.

Will it fit on your boat?
Subject to production and printing limitations, the product images (left) are actual size. So will they fit on your boat? Try them for yourself and see.

Raymarine Apps

Raymarine apps; RayView turns smartphones/tablets into remote c or e Series repeater displays, RayRemote turns smartphones into a c or e Series remote control keypad and RayControl transforms tablets into an e Series 2-way control and display. Connecting is easy! Just go to iTunes, Google Apps or Amazon to download and get started.



Voyage Planner
Voyage Planner is a powerful, easy-to-use, home-planning and data management software solution for Raymarine multifunction displays.

Navionics mobile
Synchronize waypoint locations, favourite fishing spots and route plans between e Series and c Series MFDs and the Navionics Mobile app.

Notes: Raymarine e Series and c Series owners can connect their MFDs to Raymarine mobile apps by upgrading their MFD to v3.15 software or above, available as a free download at **www.raymarine.com**

For minimum specifications, please go to our website **www.raymarine.com.**

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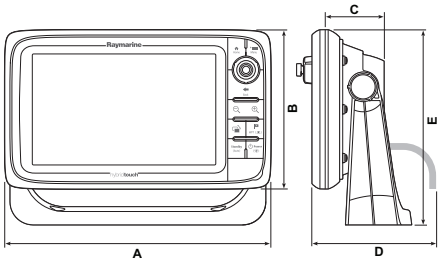
SPECIFICATIONS

Nominal voltage: 12/24 v DC (e7/e7D: 13.8v DC)
Operating voltage range: 10.8 – 31.2 v DC (e7/e7D: 10.2 – 15.6 v DC)
Power consumption (at full brightness): • c95/c97/e95/e97: 16W maximum • c125/c127/e125/e127/: 36W maximum • e165: 45W maximum • e7/e7D: 10.2: 13.2W
Display: • e7/e7D: 7"TFT backlit LED • c95/c97/e95/e97: 9" TFT backlit LED • c125/c127/e125/e127: 12.1" TFT backlit LED • c95/c97/e7/e7D/e95/e97: (800 x 480 pixels) • c125/c127/e125/e127/e165 (1280 x 800 pixels)
Viewing angles: • e7/e7D: 70° left/right and 70°/50° top/bottom • c95/c97/c125/c127/e95/e97/e125/e127: 80° left/right and 80°/60° top/bottom • e165: 80° left/right and 70°/70° top/bottom
Weight: • e7: 1.465kg (3.23lb) • e7D: 1.550kg (3.42lb) • c95/e95: 2.165kg (4.77lb) • c97/e97: 2.265kg (4.99lb) • c125/e125: 3.320kg (7.32lb) • c127/e127: 3.450kg (7.6lb) • e165: 5.6kg (12.3lbs)
Networking: up to six displays plus sensors
Mounting options: Surface mount. Trunnion mount with optional bracket.
Cartography: Worldwide base map for non cartography variants. Navionics ready-to-navigate in all other variants (upgradable to Navionics Gold or Platinum Plus).
GPS: Built-in 50 channels; WAAS, EGNOS and MSAS. 1 second hot start; 36 seconds upwards cold start; Automatic signal acquisition and almanac update;
Operating frequency: 1575.42MHz; Geodetic Datum: WGS-84, alternatives available through Raymarine displays; Active Jamming Reduction; Ceramic Chip antenna; Accuracy: without SBAS <15m 95% of the time. With WAAS/EGNOS <5m 95% of the time (e165 requires external GPS sensor)
Operation temp range: -25° to 55°C (13° to 131°F)
SeaTalk^{hs} (Network) Connectivity: • e7/e7D: 1x SeaTalk^{hs} port. 100Mbits/s. RayNet type • c95/c97/e95/e97/c125/c127/e125/e127/e165: 2x SeaTalk^{hs} ports. 100Mbits/s. RayNet type.
NMEA2000 Connectivity: 1x SeaTalk^{ng} connector
NMEA0183 Connectivity: 1x Input and output, 1x input only , (4800/38,400 Baud)
Wireless Connectivity: WiFi: 802.11 b/g; Bluetooth: AVRCP 2.1+EDR power class 1.5.
Video: All displays have x1 BNC (female) composite video input connector (PAL/NTSC formats). e95/e97/e125/e127/e165 displays have a second BNC input plus x1 VGA output via accessory cable (sold separately). Support for IP cameras.
Sonar: ClearPulse with 50/83/200 kHz operating frequencies up to 600W RMS. Sonar transducer port (e7D/c97/e97/c127/e127 versions only).
Waterproofing: IPX6 and IPX7

Note: All specifications are preliminary and subject to change without prior notice.



Dimensions (mm)					
	A	B	C	D	E
e7/e7D	233	145	64	160	180
c/95/c97/e95/e97	290	173	64	160	212
c125/c127/e125/e127	354	222	69	160	256
e165	426	282	69	176.6	295

PART NUMBERS

New e Series Multifunction Displays

E62354	e7 7" – no charts
E62355	e7D 7" with sonar – no charts
E70021	e95 9"MFD display no charts
E70022	e97 9" with sonar – no charts
E70023	e125 12.1" – no charts
E70024	e127 12.1" with sonar – no charts
E70025	e165 15.4" – no charts
E62351	RCU-3 Remote control

New c Series Multifunction Displays

E70012	c97 (9.0") with Sonar – no Charts
E70014	c127 (12.1") with Sonar – no Charts
E70011	c95 (9.0") – no Charts
E70013	c125 (12.1") – no Charts

With Charts

c and e Series MFDs are available with cartography for Europe, Rest of the World, USA, USA Inland Waterways and Canada. For a full listing of part numbers, please see our price list or visit our website.

FREE WARRANTY UPGRADE FROM 2 YEARS TO 3 YEARS

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Safety Notice
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Trademarks
For a list of trademarks, please refer to our website **www.raymarine.com.**

Photography.
The lifestyle photography used in this brochure is courtesy of: Rustler Yachts Ltd; Windy Boats AS; Primatist

Note: *Equipment described herein may require US Government authorisation for export purposes. Diversion contrary to US law is prohibited.*

www.raymarine.com

Raymarine®
A FLIR COMPANY

LIT70065

a65 | a67

Compact ▸ Full-Function ▸ Multifunction Displays

INNOVATION • QUALITY • TRUST

Raymarine®

a Series
Compact Dimensions
Big Specifications

Powerful, go-anywhere, touch screen a65 and a67; the speed and simplicity of Raymarine full-function navigation in a sleek 5.7" display.

a65: the perfect choice for chartplotting and networking

a67: the ClearPulse® digital sonar equipped a67 is the choice of serious anglers looking for a powerful GPS/ Sonar combo with extensive add-on options

Split-screen chart and radar*

Power save mode

Radar* with on-screen controls

**** Radar antenna required for radar functionality***

Images and content for illustration purposes only.

NEW a Series Multifunction Display

- Swipe, Touch and Navigate – very simple. Powered by Raymarine's intuitive LightHouse user interface
- Super Bright LED Technology – sunlight viewable optically-bonded display
- Super-fast dual core processor plus a powerful graphics processor
- Power save mode

LightHouse User Interface

Personalise

Create custom navigation pages by dragging and dropping applications to the desired location on the page. The LightHouse user interface also guides you through setup and configuration with an easy to use start up wizard.

Make sure you are up to date with latest features available from **www.raymarine.com**/Service and Support/ Raymarine Software Updates.

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CHARTING

- 50 Channel internal GPS sensor
- Charts: – a Series can be supplied with Navionics Silver, Gold or Platinum Plus cartography
- Easy to use; with a simple start up wizard and on-screen user guide
- Powerful waypoint management tools. Search waypoints and favourite routes, and plan routes with a few simple touches

AUDIO

- Pair with your smartphone and control your MP3 music remotely using Bluetooth

SONAR

- A powerful combo – the a67 combines all the navigation capabilities of the a65 with a built in ClearPulse® digital sonar
- Fully automatic ClearPulse digital sonar technology provides uncluttered, highly detailed display of fish and bottom structure
- Powerful 600 Watt digital sonar automatically adapts and adjusts sonar parameters for a clear image of fish and bottom down to 914m (3000ft.)*
- Dual Frequency – 200kHz for shallow water operation and 50kHz for offshore fishing
- Optional Ultra Wide FanBeam 200kHz transom transducer offers 3× the beam width of conventional 200kHz transducers
- Trolling motor ready – optional adapter enables use of Minn Kota's Universal Sonar trolling motor transducer (83kHz)

* *Actual depth performance may vary. Sea conditions, temperature and water salinity can affect the maximum depth range of the sonar*

NETWORKING

- Fast Raynet Ethernet (SeaTalk*hs* compatible) port for networking with up to 6 Raymarine MFDs
- Network support for Raymarine Digital radar, HD Color and SHD Color radar, ClearPulse® CHIRP sonar modules
- NMEA2000 and SeaTalk*ng* connectivity

FUEL MANAGEMENT

- Advanced fuel monitoring with time-to-empty and distance to empty calculations and fuel range rings display overlaid on navigation charts
- Tank level indicators

Chart
Navionics Silver Cartography as standard

Sonar
ClearPulse sonar built-in on a67 module

clear pulse

Radar
Optional Digital, HD and SHD Digital Color Radar

NAVIONICS THE LEADER IN ELECTRONIC CHARTS · Bluetooth · FUSION

Notes: *Sonar module required for sonar functionality. Radar antenna required for radar functionality.*

It's Extremely **Well Connected**

Actual size (subject to printing limitations)

Networking

Network a65/a67 with e Series and c Series MFDs

Fuel Management

Chartplotter mode with fuel range rings. Other fuel data includes Time to Empty and Fuel Economy.

Audio

Control your audio with Bluetooth or Fusion link. Fusion Marine Stereo home screen access. Full control of Fusion 700 Series

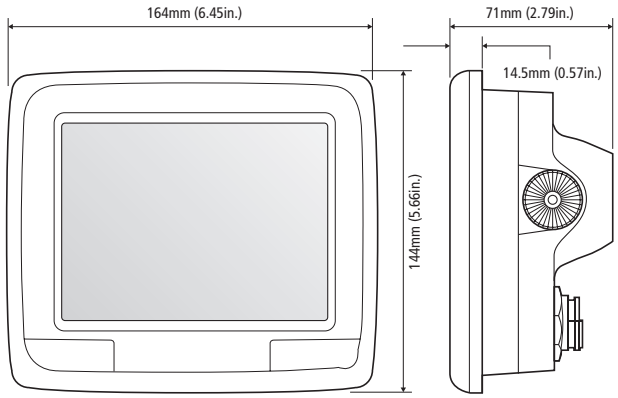
IP Camera Support (requires ONVIF compatibility)

Accessories

1. Upgrade an a65 with a DSM30/ DSM300 Sonar, or add a CP450C CHIRP Sonar module for the ultimate in fishfinder technology
2. AIS350/AIS650 Automatic Identification System (AIS) modules
3. Digital, HD or SHD Digital Color radar antennas
4. Autopilots
5. Optional Wireless Control. The RCU-3 wireless remote offers simple 3 button control of the MFD using Bluetooth. Wheelmount or lanyard (supplied).

a65/a67 SPECIFICATIONS

Nominal voltage supply: 13.8 v DC
Operating voltage range: 10.2 – 15.6 v DC
Current consumption at full brightness: a65/a67: 9/12W
Current consumption in standby mode: less than 100mW
Operating Temperature range: -10ºC to +50ºC (14ºF to 122ºF)
Storage Temperature: -15ºC to +65ºC (5ºF to + 149ºF)
Waterproofing standard: IPX6 and IPX7
Display size: 144.8mm (5.7")
Display resolution: 640 x 480 pixels (4:3 format)
Colour depth: 24 bit
Viewing angles: 70º left/right/top and 45º bottom
Networking: Up to 6 units
Connections: 1 × Raynet (SeaTalk***hs***); 1 × SeaTalk***ng***
Dimensions (w) x (h): 164mm x 144mm (6.45" x 5.67")



a65/a67 Dimensions

ORDERING INFORMATION

E70076	a65 Touchscreen MFD without cartography
E70077	a67 Touchscreen MFD with Built-In Sonar Module without cartography
E70076-US	a65 Touchscreen MFD – with Navionics Silver Coastal Cartography for USA
E70076-EU	a65 Touchscreen MFD – with Navionics Silver Cartography for Europe
E70076-RW	a65 Touchscreen MFD – with Navionics Silver Cartography for Rest of World
E70076-IN	a65 Touchscreen MFD – with Navionics Silver USA Inland Cartography
E70076-CN	a65 Touchscreen MFD – with Navionics Silver Cartography for Canada
E70077-US	a67 Touchscreen MFD with Built-In Sonar Module – with Navionics Silver Coastal Cartography for USA
E70077-EU	a67 Touchscreen MFD with Built-In Sonar Module – with Navionics Silver Cartography for Europe
E70077-RW	a67 Touchscreen MFD with Built-In Sonar Module – with Navionics Silver Cartography for Rest of World
E70077-IN	a67 Touchscreen MFD with Built-In Sonar Module – with Navionics Silver USA Inland Cartography
E70077-CN	a67 Touchscreen MFD with Built-In Sonar Module – with Navionics Silver Cartography for Canada

3

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www.raymarine.com

Raymarine®
A FLIR COMPANY

LIT70068

Raymarine Instruments

i40 ▸ i50 ▸ i60 ▸ i70 ▸ Wireless

INNOVATION • QUALITY • TRUST

Raymarine®

Whether your passion is sailing, power boating or fishing, the i70 instruments are for you

Display what you want to see where you want to see it

The stylish new Raymarine i70 instrument display is packed full of powerful features but remains very easy and slick to use. The large 4" LCD screen is a model of clarity for superb visibility at distance and acute angles.

Key features

- 4" over-sized LCD display with 160º viewing angles
- 43mm digits in full screen mode
- Anti-reflective coating for improved visibility in bright sunlight
- New LightHouse user interface is simple and quick to use
- AIS repeater and display of AIS targets
- Data views include: Wind, Speed, Depth, Tridata, Engine (NMEA 2000), Environmental (NMEA 2000), Fuel (NMEA 2000) and navigation
- Low power – typically 132mA/ 1.6W

Analogue style

Digital style

Customisation

The Raymarine i70 instrument can be customised to suit your personal boating requirements. From traditional analogue dials to engine information and tank levels, i70 has the capabilities to show it all.

LightHouse
User Interface

All New LightHouse User Interface

Designed for the way boaters think, Raymarine's exclusive LightHouse User Interface offers an incredibly easy-to-use navigation experience. LightHouse intuitively places frequently used navigation functions right at your finger-tips.

The LightHouse User Interface is also consistent with the latest Raymarine multifunction displays. So once you are familiar with i70 you'll be at home with the Raymarine MFDs too!

Images and content for illustration purposes only.

Choice of 4 colour palettes

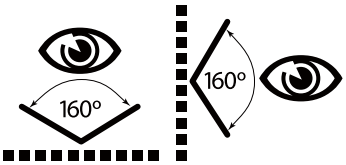
- Anti reflective coating for improved visibility
- LED backlighting
- Slimline bezel for maximum screen size
- Low-profile housing (13mm)
- Four-button user interface

Tech Tip

Will it fit on your boat?
Subject to production and printing limitations, the product image (above) is actual size. So will they fit on your boat? Try it for yourself and see.

AIS
Display AIS targets from NMEA 2000 AIS receivers. View the closest 25 AIS equipped vessels and select individual targets to obtain vessel information.

Networking
Raymarine i70 seamlessly integrates with NMEA 2000 using SeaTalk and SeaTalk*ng* marine networks. User-selectable data sources allow integration on multi-sensor networks.



160° viewing angles ensure data can be seen clearly at acute angles.

Full screen virtual analogue wind

Analogue and digital data

All in one navigation display

Autopilots
Matching autopilot heads (p70 and p70R) are also available. For more information on these heads, visit our website www.raymarine.com or see our autopilot leaflet.

i40 compact Speed, Depth, Wind and Bidata instruments

Big displays for smaller powerboats, yachts and RIBs, these compact yet powerful SeaTalk instruments offer full integration with Raymarine autopilots and navigation equipment and can be surface or trunnion mounted. Extra large (28mm max) digits and razor sharp LCDs – easy-to-use i40 instruments have outstanding visibility in all lighting conditions.

i40 Speed

- Current, maximum and average boat speed
- Log, trip and sea temperature

i40 Depth

- Crystal clear depth readout.
- Shallow and deep anchor alarms and minimum depth display

i40 Wind

- Apparent wind speed and direction and true wind speed and direction
- Talks to your autopilot to steer your boat to a selected apparent wind angle

i40 Bidata

- Speed, depth, log
- Sea temperature
- Two sets of data at once in large or small digits

---

i50 and i60. Analogue and digital instruments.

Tech Tip

Will it fit on your boat?
Subject to production and printing limitations, the product image (below) is actual size. So will they fit on your boat? Try it for yourself and see.

The new i50 and i60 instruments are designed to compliment the all new Raymarine c and e Series multifunctional displays. These stylish, dedicated-function instruments are the perfect solution for smaller power boats, yachts and rigid inflatables. The i50 range consists of 3 digital displays. Speed and depth displays with extra-large digits and a multi-line tridata unit. Designed primarily for the sailboater, i60 covers wind and close-hauled wind options in analogue and digital formats.

Excellent viewing angles for both day and night conditions and simple, push-button controls make i50 and i60 instruments extremely easy to see and use. They are also simple to install thanks to the front-mount design.

General Features

- i60: Large analogue dials
- i50: Large numerals and digits
- SeaTalk and SeaTalk^{ng} interfaces
- NMEA2000 (compatible) interface
- Built-in transducer interface
- 110mm x 115mm footprint identical to older Raymarine ST60+ instrumentation
- Large controls for ease of use at sea
- Low power consumption
- Multiple data source support eliminates potential data conflicts
- Front mounted design for simple installation

Images and content for illustration purposes only.

General Features

- Red backlighting for improved visibility
- SeaTalk interface (SeaTalk*ng* when used with SeaTalk converter)
- Built-in transducer interface
- Same footprint as the older Raymarine ST40
- Large controls for ease of use at sea
- Low power consumption

Tech Tip

Will it fit on your boat?
Subject to production and printing limitations, the product image (left) is actual size. So will they fit on your boat? Try it for yourself and see.

i50 Speed

- Speed through water or Speed over ground (GPS required)
- Sea surface temperature
- Trip and Log data

i50 Depth

- Large digits
- Depth trend indicator
- Minimum and maximum depth
- Audible shallow, anchor and deep water alarms

i50 Tridata

- Combines depth and speed data
- Easy-to-read 3-line display; dedicated depth and speed displays
- Trip/log, sea temperature and SOG

i60 Close Hauled Wind

- Magnified 20° – 60° display
- The perfect instrument when a single degree can make all the difference

i60 Wind

- Analogue and digital data
- Calculates apparent (relative) and true wind speed/angle (true wind requires SeaTalk speed through water data)

Long/Short Arm Wind Transducers
Compatible with the following instruments:
- i60 (direct connection)
- i70 via iTC-5 transducer converter

Rotavecta Wind Transducer
Compatible with the following instruments:
- i40/i60 (direct connection)
- i70 via iTC-5 transducer converter

Wireless Wind Transducer
This robust, solar powered wireless Wind Transmitter sends data from the top of your mast wirelessly to Raymarine wireless displays.

Wireless Vertical Wind Transducer
A wireless and solar powered wind transducer for Raymarine wireless displays.

Speed/Depth/Temp Transducers
Go to our website **www.raymarine.com** to see compatible transducers for use with Raymarine instruments.

Raymarine wireless instruments

You need instant access to accurate data, and displays that are absolutely reliable. Raymarine Wireless instruments display all the data you'll need and there are no wires running through your hull or down your mast.

Tech Tip

Will it fit on your boat?
Subject to production and printing limitations, the product image (above) is actual size. So will they fit on your boat? Try it for yourself and see.

Wireless Cruising Displays

T110 Multifunction Display
- Solar powered
- 300 hours autonomy
- Displays any single data type
- Super-large 38mm (1.5") digital readout

T111 Dual Display
- Solar Powered
- 300 hours autonomy
- Displays 2 lines of data
- Large 20mm (0.8") digital readout

T112 Analogue Display
- Solar Powered
- 300 hours autonomy
- Combination of display formats
- Large 14mm (0.56") digits
- Simple to configure

Wireless Racing Displays

T210 Maxi Display

- Large, solar-powered mast display
- Designed for racing yachts
- Provides highly visible and accurate data
- Massive 50 mm (2 in) digits

T215 Dual Maxi Display

- Excellent visibility by night
- Red or amber digits allows you to select different colours for different data.
- Control and configure anywhere onboard with the Raymarine Wireless Remote Display

T070 Race Master

- Tactical race compass and wind shift indicator
- Heading and distance above or below mean course
- Displays how much you're being headed or lifted
- Quickly establish favoured end of the start line
- Sail the shortest distance to the windward mark

Tech Tip

Will it fit on your boat?
Subject to production and printing limitations, the product image (above) is actual size. So will they fit on your boat? Try it for yourself and see.

T060 Micro Compass

- Light and easy to read
- Reliable and precise
- Tactical scale provides clear, stable figures for port and starboard tacks
- When tacking, readings are always the same, so you never have to remember numbers

T113 Wireless Remote

- Not just a remote control. More an essential item of equipment for those serious about winning.
- The Raymarine Wireless Remote Display controls, configures and repeats all the data you need to improve performance, including: Wind trends; Speed trends; VMG to wind and waypoint; SOG; COG; performance graphing.

SPECIFICATIONS

i40 Instruments
Nominal voltage: 12 v DC
Operating voltage: 10–16 v DC
Current consumption: Speed and Wind 25mA; Depth 30 mA; Bidata 35 mA
Operating temperature: 0°C to +55°C
Connections: SeaTalk, Transducer connections. Compatible with marine industry CAN systems

i50 Instruments
Nominal voltage: 12 v DC
Operating voltage: 10–16 v DC
Power consumption: typically <1W (display only) and 2.4W maximum with transducer connected
Current consumption: Speed and Wind 25mA; Depth 30 mA; Tridata 35 mA
Operating temperature: -20°C to +55°C
Connections: 2 x SeaTalk^{ng} and transducers. Compatible with marine industry CAN systems

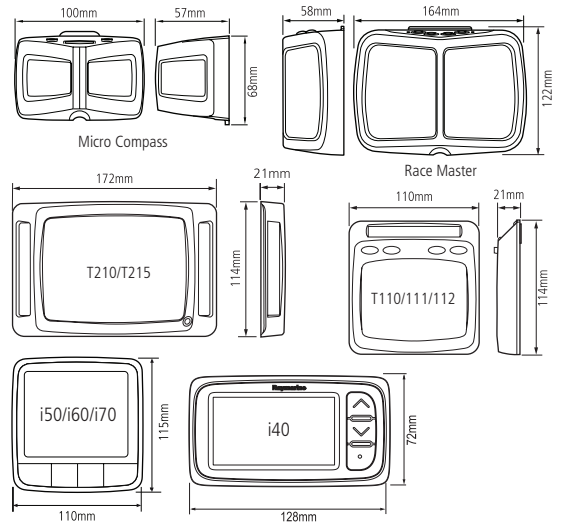
i60 Instruments
Nominal voltage: 12 v DC
Operating voltage: 10–16 v DC
Power consumption: typically <1W (display only) and 2.4W maximum with transducer connected
Current consumption: 45 to 65mA (display only) and 200mA maximum with transducer connected
Operating temperature: -20°C to +55°C
Connections: 2 x SeaTalk^{ng} and transducers. Compatible with marine industry CAN systems

i70 Instruments
Nominal voltage: 12 v DC
Operating voltage: 10.7–32 V dc
Power consumption: 1.6 Watts
Operating temperature: -25°C to +55°C
Connections: SeaTalk^{ng} (x2)°. Compatible with marine industry CAN systems

Wireless Instruments (Generic Features)
Power: Solar powered (300 hours autonomy)
Waterproof: Submersible to 10m (32.8ft)
Weights: Maxi and Dual Maxi 360g (0.79lb); Multi Digital and Analogue 360g (0.79lb); Remote 135g (0.29lb); Micro Compass 150g (0.33lb); Race Master 445g (0.98lb)

Note: All specifications are preliminary and subject to change without prior notice.

Generic Specifications
Water proofing: IPX-6
Relative humidity: up to 93%
Storage Temperature: -30°C to +70°C



PART NUMBERS

i40 Instruments
E70063 i40 Speed
E70064 i40 Depth
E70065 i40 Wind
E70066 i40 BiData

i50 Instruments
E70058 i50 Speed
E70059 i50 Depth
E70060 i50 Tridata

i60 Instruments
E70061 i60 Wind
E70062 i60 CH Wind

i70 Instruments
E22172 i70 Multifunction Colour Display

Wireless Instruments
T210 Multi Maxi Display
T215 Multi Dual Maxi Display
T113-868 Remote Control
T070-868 Race Master
T060 Micro Compass
T110-868 Multi Digital Display
T111-868 Multi Dual Digital Display
T112-868 Maxi Analogue Display

3

FREE WARRANTY UPGRADE FROM 2 YEARS TO 3 YEARS

Raymarine offers a 2 year Limited Warranty (upgradable to 3 years upon product registration) on products installed in vessel use classifications within this brochure, full details of the Global Warranty Policy and how to register your products can be found at **www.raymarine.com/warranty**. If you require local assistance, please contact a Raymarine certified dealer near you, details of which can be found at **www.raymarine.com/dealerlocator**.

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Raymarine Belgium (Order Processing) T: (+32) 765 79 41 74	**Raymarine Denmark** T: (+45) 4371 6464	**Raymarine Germany GmbH** T: (+49) (0) 40 237 8080
Raymarine Nederland T: (+31) (0) 26 361 4242	**Raymarine Norway** T: (+47) 69 264 600	**Raymarine Sweden AB** T: (+46) 317 633670

Safety Notice
Raymarine products are intended to be used as aids to navigation and must never be used in preference to sound navigational judgement. Their accuracy can be affected by many factors, including environmental conditions, equipment failure or defects, and incorrect installation, handling or use. Only official government charts and notices to mariners contain all the current information needed for safe navigation, and the captain is responsible for their prudent use. It is the user's responsibility to use official government charts, notices to mariners, caution and proper navigational skill when operating any Raymarine product.

Content Note
The technical and graphical information contained in this brochure, to the best of our knowledge, was correct as it went to press. However, the Raymarine policy of continuous improvement and updating may change product specifications without prior notice. Therefore, unavoidable differences between the product and this brochure may occur from time to time, for which liability cannot be accepted by Raymarine.

Specifications
All specifications are subject to change without prior notice. Visit **www.raymarine.com** for the most up-to-date specifications. Some images are for illustration purposes only.

Trademarks
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Photography.
The lifestyle photography used in this brochure is courtesy of: Jeanneau (Beneteau Group); Joe McCarthy; Windy Boats AS; Rustler Yachts Ltd; Redbay RIBS.

Note: *Equipment described herein may require US Government authorisation for export purposes. Diversion contrary to US law is prohibited.*

www.raymarine.com

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A FLIR COMPANY

LIT70067

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Raymarine Autopilots

Above Deck Pilots ▸ Inboard Pilots

INNOVATION • QUALITY • TRUST

Raymarine®

Autohelm autopilots: Your experienced Extra Crew Member

So what is an autopilot? An autopilot connects to your steering system and continually corrects your boat's heading with information supplied by the compass, wind transducers or GPS/Plotter.

Autopilots are designed to maintain an accurate course in various sea conditions with minimal helm movement. They can act as a spare pair of hands or an extra crew member allowing you to trim the sails or get the fenders over the side. Because they steer so accurately, they will save fuel and get you to your destination faster, especially when connected to a chartplotter.

What does an autopilot consist of?
Autopilots consist of three main components:

❶ Heading sensor (usually a compass)
❷ Course computer/processor and control head (the brains)
❸ Drive mechanism (the business end)

Autopilot Types
There are two types of autopilot; Above Deck and Inboard.

Above deck autopilot for tiller-steered yachts:

Above Deck Autopilots

❶ **Above Deck** autopilots are simple to install and remain in the cockpit in all types of weather.

Tech Tip

Installation
We recommend that you consult a Raymarine approved dealer who can specify, install and commission the correct Raymarine system for your boat. An approved installation also carries our full worldwide 2 year warranty, extendable to 3 years on product registration.

Inboard Autopilots

❷ **Inboard (below decks)** autopilots are permanently mounted below decks and are more powerful, more reliable, steer your boat better and can be supplied with a range of autopilot controllers.

Raymarine autopilot systems integrate seamlessly with our line of multifunction display products for easy tracking to plotted waypoints and routes. We offer a full range of autopilot systems for vessels of all sizes. Our team of trained autopilot specialists and technical dealers stand ready to help you design the best solution for your vessel.

Typical inboard system: course computer, control head and drive unit.

Tech Tip

Important displacement information. Always take the fully laden displacement weight of your vessel into account, this is often 20% above the designed displacement, so don't be tempted to choose a pilot which will always be working at the limits of its design capabilities. If you choose your pilot with safety in mind, it won't struggle when the going gets tough.

SmartPilot Inboard Autopilots

Adding a Raymarine autopilot system to your vessel is one of the smartest choices you can make. In addition to the convenience it offers on long passages, today's autopilot systems offer you significant economic advantages too. Raymarine SmartPilot systems save both time and fuel by steering the straightest course possible. Integration with optional wind, speed and heading sensors allow the autopilot to compensate for the effects of winds and currents automatically.

1: Know Your Boat

What is the size of your boat and its displacement? Always take the fully laden displacement weight of your vessel into account, this is often 20% above the designed displacement.

What steering system do you have? You will need to find out what type of steering system is installed on your vessel. This may involve opening a few hatches and looking at the gear, or this can be a simple case of consulting your boat dealer or steering manufacturer.

If your system is hydraulic. You'll need to find out the size (in cc) of the hydraulic cylinder ram(s) mounted to the rudder on inboard engined boats, or mounted to the drive unit on outboard engined boats. Your steering system documentation will have this information.

Not sure what steering system is installed on your vessel? Please consult an authorised Raymarine dealer. Raymarine dealers are highly-skilled and have been Raymarine-trained to evaluate and assist you in selecting the right autopilot for your boat.

2: Make contact with your Raymarine Dealer

Once you have gathered all the relevant information pertaining to your boat and its drive system, consult your local Raymarine dealer to determine the best Drive Unit, Course Computer and Control Head combination for your vessel.

Please see points 3, 4 and 5 for drive unit selection, course computer matching and choosing a control head.

3: Drive Unit Selection

The drive unit interfaces with your vessel's steering system to keep you on the right course. Raymarine has a broad range of drive units to match almost any type of steering system and vessel displacements (see table).

Raymarine SmartPilot systems accommodate hydraulic, mechanical and power assisted stern drive systems.

Hydraulic steering

Raymarine SmartPilots connect to hydraulic steering systems using rugged hydraulic pumps matched to the capacity of the hydraulic steering system.

Mechanical steering

Raymarine SmartPilot drive units for mechanical steering systems are available in following configurations: ❶ linear ❷ hydraulic linear ❸ rotary

4: Course Computer Matching

The course computer is the central intelligence hub of the autopilot system, linking the autopilot control head to the drive unit. Features include:

Rate Gyro. Every Raymarine SPX system comes with a rate gyro to provide the best possible performance.

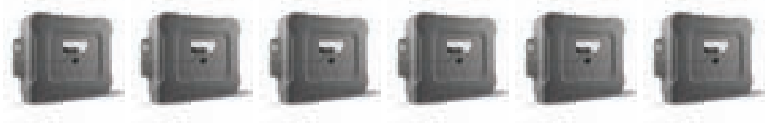
Advanced Steering Technology (AST). Intelligently monitors vessel yaw and anticipates course changes as well as ensuring razor-sharp course keeping.

AutoLearn. Automatically understands the vessel's steering characteristics, simplifying calibration and allowing the vessel to constantly adapt to changing sea conditions.

Drive Units	RAM Capacity (cc) (Hydraulic)	Vessel Displacement (kg)
Type 0.5L Hydraulic Pump	50-110	
Type 1 Hydraulic Pump	80-230	
Type 1 Mechanical Rotary / Linear Drives		11,000
Type 1 Universal Stern Drives		
Type 2 Hydraulic Pump	230-350	
Type 3 Hydraulic Pump	350-500	
Type 2 Hydraulic Linear		22,000
Type 3 Hydraulic Linear		35,000
Type 2 Short Mechanical Linear Drives		15,000
Type 2 Long Mechanical Linear Drives		20,000
Type 2 Mechanical Rotary Drives		20,000
Solenoid Drive Units		
Volvo Penta IPS Drive Systems		
ZF Saildrive Systems		
NMEA2000 Steer-by-Wire CAN Based Systems		
Teleflex Optimus		

Smart Rudder Sense™ technology. Allows precise steering without the use of a rudder feedback sensor. This innovative feature is ideal for outboard engines and installations that can not fit a rudder sensor.

Course computer selection is determined by the drive unit which in turn is determined by the steering system. Please see table below.



SPX10	SPX30*	SPX-SOL	SPX-CAN	SPX-DI0	SPX-40
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5: The Control Head

While your vessel's steering system determines the type of drive unit required, and the course computer is matched to the drive unit, the choice of control head is a matter of personal preference since each fixed-mount SmartPilot Control Head offers the same level of autopilot performance.

Choose from the following control heads:

p70 Autopilot Control Head
A push-button controller with dedicated -1/+1° and -10/+10° buttons.

p70R Autopilot Control Head
Combination of push-buttons and a rotary control.

p70 Control Head

6: Call your Raymarine Dealer

Call your Raymarine dealer to purchase your autopilot and arrange installation.

S100 Wireless Control
The compact S100 gives you basic, onboard wireless control of any Raymarine SeaTalk autopilot, even if you're below deck and out of sight of your autopilot.

SmartController
Take full, onboard control of your Raymarine SeaTalk autopilot with the wireless SmartController. Wireless operation means freedom to monitor vital information when you're on deck or out of sight of your instruments.

Tech Tip

Will it fit on your boat?
Subject to production and printing limitations, the above image of the p70R Autopilot Control Head is actual size. So will it fit on your boat? Try it for yourself and see.

Fishing Patterns
Fishing patterns are available when the p70 and p70R control heads are used with SPX course computers.

S1000 Inboard Fishing Pilot

For powerboats with a Seastar hydraulic system or other balanced hydraulic system (see www.raymarine.com for steering system compatibility). The S1000 is quick to fit and simple to use; control the S1000 autopilot with the S100 wireless remote; simply steer on to your desired heading, press PILOT to engage the pilot into auto and off you go.

- Back to basics'point-and-shoot autopilot for balanced hydraulic systems
- No electronic compass or rudder reference transducer needed
- NMEA input from handheld or fixed GPS/Navigator/Plotter
- Built-in fishing patterns include cloverleaf, zig-zag and circle
- Can be linked to kicker motor
- SeaTalk GPS/Plotter compatible
- Uses COG for heading reference

Images and content for illustration purposes only.

Above Deck Autopilots

ST1000+/ST2000+ Cockpit Autopilots for Tiller Steered Yachts

Invented by Autohelm in 1973, tiller pilots have consistently been the world's most popular pilot ever since, setting the standard for performance, reliability and ease of use.

ST1000+/ST2000+ Maximum Displacement

ST2000+: 4,500kg (10,000lbs)

ST1000+: 3,000kg (6,000lbs)

SPX-5 Tiller Pilot

SPX-5 Tiller Pilot is perfect for large tiller steered yachts. Steer straight to a waypoint, lock on to a given wind angle, or simply set and follow a course to steer by making the most of the full SeaTalk and NMEA compatibility. The SPX-5 Tiller Pilot is suitable for most cruising and racing scenarios.

SPX-5 Tiller Drive Maximum Displacement

SPX-5: 6,000kg (13,200lbs)

SPX-5 Wheel Drive Pilot

The SPX-5 wheel pilot consists of a fully enclosed wheel-drive for simple installation and superb autopilot performance. Install the separate control unit where it is easy to reach and see. The course computer and fluxgate compass are mounted separately for optimum performance.

SPX-5 Wheel Drive Maximum Displacement

7,500kg (16,000lbs)

SPX-5R Helm Mount Fixed Autopilot

The SPX-5R pilot is a helm-mounted autopilot for use on smaller sports and fishing boats typically up to 9.2m (30') in length. Suitable for fixed and tilt helms, the pilot consists of a drive unit that fits over the existing steering wheel shaft, a course computer with a rate gyro for precise course keeping and control head with large LCD information display.

SPX-5 Helm Mount Maximum Displacement

RIBs and Outboards (Mechanical) up to 7.7m (25')

2,000kg (4,400lbs)

RIBs (Hydraulic) up to 9m (30')

3,181kg (7,000lbs)

Outboard (Hydraulic) up to 9m (30')

3,181kg (7,000lbs)

Power Assisted Stern Drive up to 10.7m (35')

3,181kg (7,000lbs)

For detailed information on the autopilots on this page, please visit our website www.raymarine.com

SPECIFICATIONS

Generic Specifications
Power supply: 12V systems
Absolute voltage range: 10 – 16V DC
Power consumption: SPX-5 Tiller /SPX-5 Wheel 250mA (standby mode) / ST1000/ST2000 at 40mA

ST1000/ST2000 Tiller Pilot
Weight kg (lbs): 1.53 (3.4)
Mounting methods: Reversible port or starboard
Display size: 45mm segmented LCD
Display lighting: 3 levels plus off
Connections: NMEA 0183 input and SeaTalk
Thrust: ST1000: 57kg (125lbs) ST2000 77kg (169lbs)
Stroke: 236mm (9.3in)

SPX-5 Tiller Pilot
Thrust: 84kg (185lbs)
Stroke: 254mm (10")
Connections: NMEA 0183 input / output (x1); SeaTalk (x2); SeaTalk^{ng} (x1); NMEA 2000 with adaptor

SPX-5 Wheel Pilot
Maximum recommended laden boat displacement: 7500kg (16,500lbs)
Revs per minute (rpm): 9
Thrust: 30Nm
Connections: NMEA 0183 input/output (x1); SeaTalk (x2); SeaTalk^{ng} (x1); NMEA 2000 with adaptor

SPX-5R Wheel Pilot
Thrust: 30Nm
Connections: x2 SeaTalk; x1 SeaTalk^{ng} 1x NMEA 0183 input / output
Maximum torque: 15Nm
Maximum recommended laden boat displacement: Mechanical: 2000kg (4400lbs); Hydraulic: 3181kg (7000lbs)

S1000 Pilot
Mounting methods: Surface
Weight kg (lbs): 0.4 (0.88)
NMEA 0183 inputs: 1
NMEA 0183 outputs: 1
SeaTalk connections: 1
RF transmitter and receiver: Yes
Drive: S1000 pump

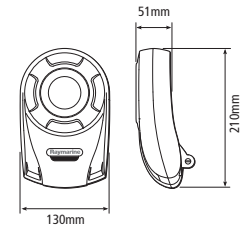
Below Deck Autopilots
For below deck autopilot specifications, please go to our website **www.raymarine.com**

Note: All specifications are preliminary and subject to change without prior notice.

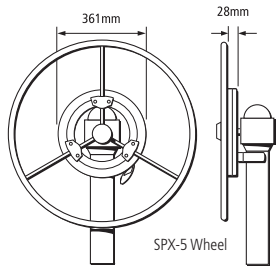
PART NUMBERS

A12004	ST1000 Tillerpilot
A12005	ST2000 Tillerpilot
E12137	SPX-5 Tiller Drive (no control head)
E12133	SPX-5 Wheel Pilot (no control head) (Core Pack)
A18081	SPX-5 Wheel Drive Unit
E12220	SPX-5R Wheel Pilot
E12222	SPX-5 Wheel Pilot (no control head)
E12169	S1000 SmartPilot Wireless Autopilot System with S100 Remote Control
E22166	p70 Autopilot Control Head (button)
E22167	p70R Autopilot Control Head (rotary)
E15024	S100 Wireless Autopilot Remote with Base Station
E15023	SmartController Wireless Autopilot Remote with Base Station

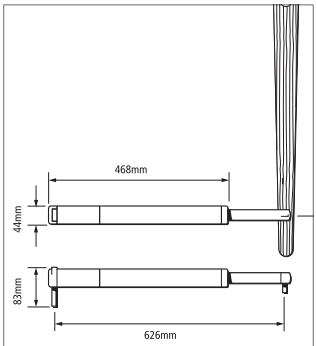
For below deck autopilot part numbers, please go to our website **www.raymarine.com**



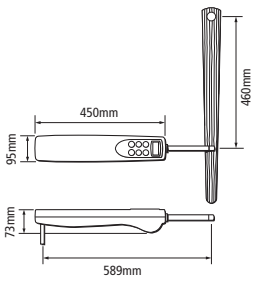
SPX-5 Helm Mount



SPX-5 Wheel



SPX-5 Tiller Pilot



ST1000/ST2000 Tiller Pilots

3 FREE WARRANTY UPGRADE FROM 2 YEARS TO 3 YEARS

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Safety Notice
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A FLIR COMPANY

LIT70066

Radar Antennas

Digital Radomes ▸ HD Digital Radomes and Open Arrays ▸ Super HD Open Arrays

INNOVATION • QUALITY • TRUST

Raymarine®

Why radar?

Where are you relative to your surroundings? Is there anything nearby that could be a danger to you, or vice versa? Radar is a great aid to navigation that allows you to:

- 'See' other vessels, buoyage and coastline in zero visibility
- Track targets – not everything transmits AIS…
- Double check your relative position and speed
- Avoid hazards and obstacles
- Track weather
- Locate fish using bird mode!

Each Raymarine marine radar system consists of a Raymarine multifunction display and your choice of Raymarine radome or open array antenna.

Radomes

Digital or HD Color Radomes are ideal when power is at a premium and mounting space is limited or restricted by rigging. Perfect for sailboats, RIBs and smaller powerboats, radomes provide exceptional performance even in the most challenging conditions – HD Color Radomes provide additional features and improved resolution.

Open Arrays

Choose an HD Color or Super HD Color open array scanner for enhanced performance and range. These larger scanners, equipped with a more efficient antenna (increased gain) and narrow beam widths, deliver substantial improvements in range and bearing resolution giving great performance and clear target separation.

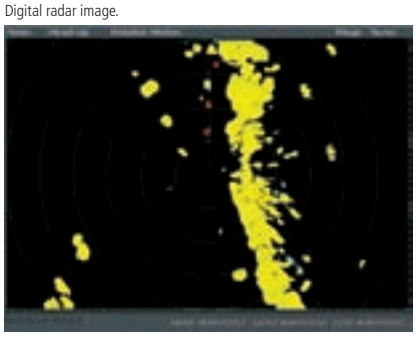
Technology and Software – what's the difference?

Raymarine has 3 different types of radar antenna:

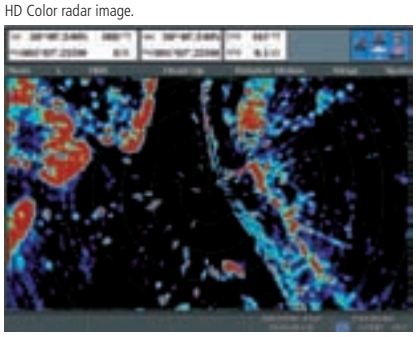
- Digital – 8 colour resolution
- HD Color – 256 colour resolution
- Super HD Color – 256 colour resolution

Images and content for illustration purposes only.

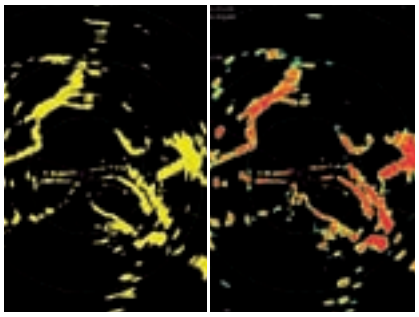
Digital radar image.



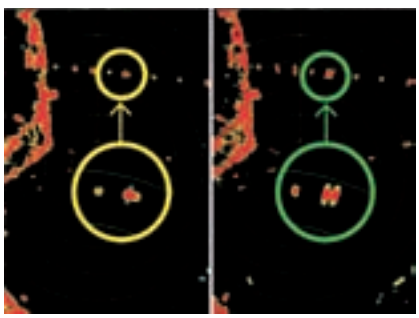
HD Color radar image.



Digital vs HD Color radar.



HD Color vs Super HD Color radar.



DIGITAL

Entry Level Digital Radar for Smaller Vessels. Offers 4kW capability for improved performance and uses digital processing for increased target definition. Digital reduces the cable size (compared to analogue) and makes an easier interface to larger systems. Lower power consumption and costs less than a full HD Color system.

HD COLOR

HD Color Radar for Superior Target Detection and Interpretation. Powerful processing helps distinguish between target types, detect weak and distant contacts automatically, while virtually eliminating clutter and noise. The truly adaptive transmitter and receiver automatically adjusts to changing environmental and sea conditions. With full 256 colour resolution, HD Color radar delivers a dramatically clearer radar picture with crisp, well-defined contact echoes, superior target separation, and a life-like target presentation.

SUPER HD COLOR

Super HD Color Radar for Ultimate Performance on Larger Vessels. Super HD Color radar has greater dynamic range than conventional radar enabling the digital receiver to acquire and process vast amounts of echo information that is normally lost by conventional analogue radar systems. With full 256 colour resolution, Super HD Colour technology intelligently isolates and identifies true radar targets, while simultaneously eliminating unwanted clutter. The extra-narrow beam width pinpoints targets with stunning clarity. The result is a dramatically clearer radar display.

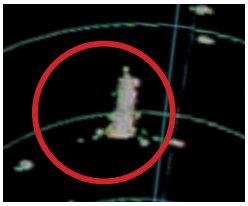
Image Comparison

Digital vs HD Color. HD Color targets are clearly defined compared to the standard Digital image.

HD Color compared to Super HD Color. Super HD Color reveals even more detail than HD Color. The Super HD Color image shows that there are actually two targets in the ringed area, whereas the same targets on the HD image appear as one.

Super HD Color radar clearly shows liner, tug and spectator sailing vessel.

25kW 8.5' commercial radar merges targets.

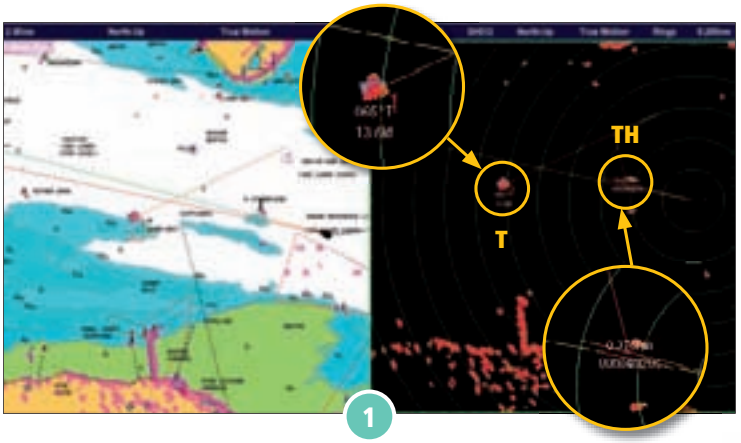


Super HD Color vs. commercial 25kW radar comparison. Target separation on longer range scales (6nm) is greatly improved. Super HD Color processing detects and separates targets undetected by the larger commercial-grade radar.

Images and content for illustration purposes only.

Track targets

Not everything transmits AIS! Using MARPA* (mini-automatic radar plotting aid) allows you to identify vessel, speed, bearing, closest point of approach (CPA) and time to closest point of approach (TCPA), dangerous/proximity alarms, overlay AIS info for further target clarification.



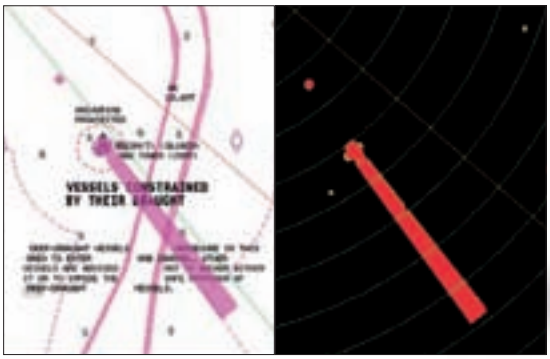
1. Target (T) has been acquired (red circle overlay) using MARPA and is being tracked by your radar. Speed and bearing of the target are shown and the target's heading is shown as a thin red line at 65°(TH).

2. The tracked target has now moved into the previously set guard zone around your vessel and has triggered the dangerous target alarm, seen on screen, and set off an audible alarm.

3. The alarm has been acknowledged and the target's (T) (now overlaid with a red triangle to note possible danger) closest point of approach (CPA) to your vessel is shown on screen as 0.376nm and time to closest point of approach (TCPA) is 4 mins 20 secs (TH).

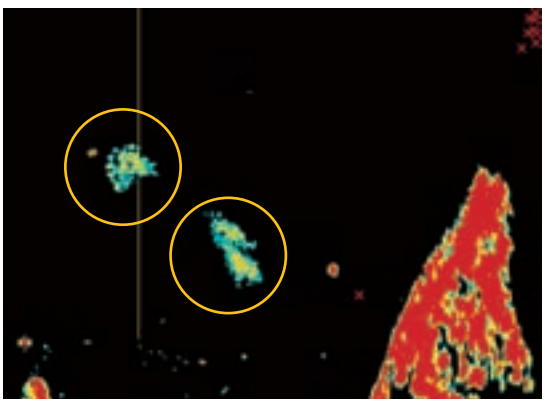
Racon and SART

Raymarine radar antennas also trigger RACON beacons and pick up signals from Search And Rescue Transponders.



Bird Mode

Bird Mode automatically tracks flocks of seabirds (circled below), giving fishermen the heads up on where the fish are.



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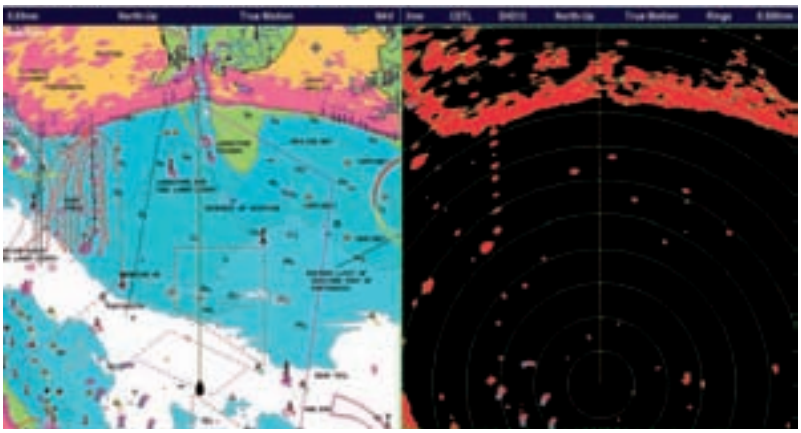
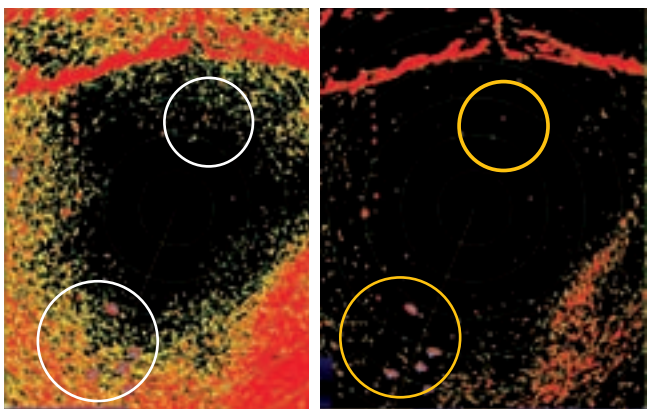
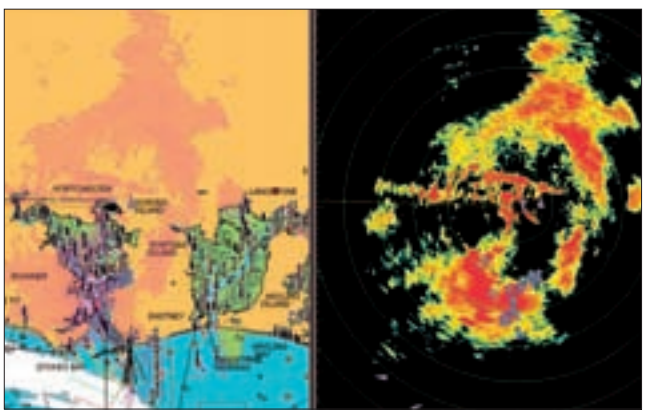


Chart Overlay
Radar can be overlaid onto a chart to clearly identify targets (as shown in the left half of the image above). Note the superior target clarity and separation on the submarine barrier to the left of both screens.

Weather advantage
Raymarine's HD Color scanners provide superior all weather performance allowing you to still see targets through rain and thunderstorms. Use radar to track weather too.



Cut the clutter
Detect targets at very close proximity to your vessel, right through to very long ranges to see distant vessels, land features and even weather fronts. Distinguish targets through even the heaviest rain clutter.



Just a few examples of the elements that you might see with your Raymarine radar:

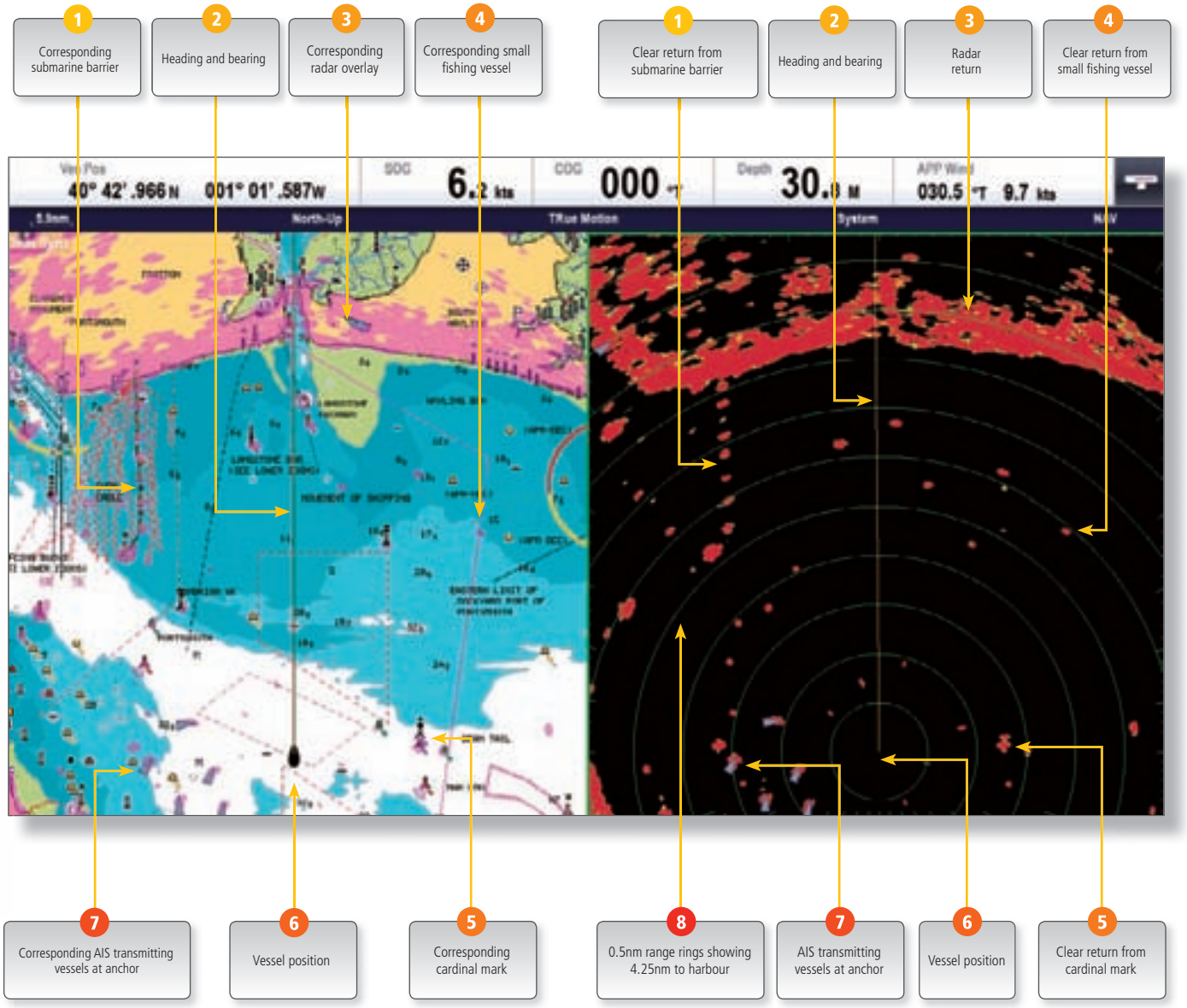


Chart view with corresponding radar overlay

Radar display

Tech Tip

Safe emissions

Powerful enough to slice through atmospheric clutter, Raymarine radars still comfortably meet International limits Radio Frequency emissions – in fact, the energy absorbed from an ordinary mobile phone can be several times greater than that from a correctly installed Raymarine radar.

Installation

All radars work on line-of-sight principles so although antennas could theoretically be fitted almost anywhere, unobstructed and parallel to the water line is better.

Interference resistance

Raymarine radars use interference rejection technology to resist signal interference from other vessels' transmissions as well as close proximity objects already fitted to the boat.

256 colour resolution

Helps define the strength of target returns and highlights targets that could be hidden within clutter.

RACON and SART

Raymarine radar antennas also trigger RACON beacons and home in on signals from Search And Rescue Transponders.

Pulsed magnetron vs broadband (FMCW) radar technology

Broadband (FMCW) radars typically emit low levels of energy, resulting in loss of ultimate performance in conditions of fog, rain, spray and snow, and limiting target detection at longer ranges.

Raymarine pulsed magnetron radars combine low average energy with high peak powers allowing the radar to detect targets at greater ranges, and to punch through adverse weather conditions ensuring targets are identified.

	RADAR – MULTIFUNCTION DISPLAY COMPATIBILITY*	
	a Series / c Series / e Series	G Series
Digital radar	●	●
HD Color and Super HD Color	●	●
Dual range	With HD Color and Super HD Color radar only	With HD Color and Super HD Color radar only
Bird mode and high speed radar scanning (48rpm)	With HD Color dome and Super open array only	With HD Color dome and Super HD Color open array only
Dual radar antenna installation	Yes but accessible one at a time, one or the other	Can access both radars at the same time

* For previous multifunction display compatibility, please check **www.raymarine.com**

RADOME AND OPEN ARRAY FEATURES COMPARISON

		Peak power output (kW)	Maximum range scale	Colours	Rotation rate	Signal processing	Horizontal beam width -3dB	Vertical beam width -3dB	Near and far dual range mode	Bird mode	Pulse length / PRF (auto target / expand)	Weight kg	Automatic harbour, coastal offshore and buoy modes***	256 multi-level colour and selectable colour palettes	SeaTalkhs networking	a Series / c Series / e Series	G Series
24" / 48" RADOMES	18" RD418D	4	48	8	24	Digital	4.9°	25°			8	9.5	●		●	●	●
	24" RD424D	4	48	8	24	Digital	3.9°	25°			8	10	●		●	●	●
	18" RD418HD	4	48	256	24/48	HD Color	4.9°	25°	●	●	8	9.5	●	●	●	●	●
	24" RD424HD	4	48	256	24/48	HD Color	3.9°	25°	●	●	8	10	●	●	●	●	●
48" OPEN ARRAYS	48" RA1048D	4	72	256	24	HD Color	1.9°	25°	●		8	25.6	●	●	●	●	●
	48" RA1048SHD	4	72	256	24/48	SHD Color	<1°**	25°	●	●	8	25.6	●	●	●	●	●
	48" RA3048HD	12	72	256	24	HD Color	1.9°	25°	●		8	25.6	●	●	●	●	●
	48" RA3048SHD	12	72	256	24/48	SHD Color	<1°*	25°	●	●	8	25.6	●	●	●	●	●
72" OPEN ARRAYS	72" RA1072D	4	72	256	24	HD Color	1.15°	25°	●		8	29	●	●	●	●	●
	72" RA1072SHD	4	72	256	24/48	SHD Color	<1°*	25°	●	●	8	29	●	●	●	●	●
	72" RA3072HD	12	72	256	24	HD Color	1.15°	25°	●		8	29	●	●	●	●	●
	72" RA3072SHD	12	72	256	24/48	SHD Color	<1°*	25°	●	●	8	29	●	●	●	●	●

** Horizontal beam width on Super HD Color open arrays adjustable to less than 1°
*** Digital domes only provide Harbour, Coastal and Offshore auto modes for the Sea Clutter adjustment. All others provide presets for Buoy, Harbour, Coastal and Offshore.

RADAR SPECIFICATIONS

Power
System Voltage: 12 / 24V Systems
Voltage range: 10.8 – 32 V DC
Power consumption:

	Typical	Standby	Sleep
Digital Radome (@ 24V):	40W (@ 24rpm)	25W	1.2W@24V
HD Color Radome (@ 24V):	45W (@ 48rpm)	25W	1.2W@24V
Open Array 4kW (@ 24V):	70W (@ 48rpm)*	30W	1.2W@24V
Open Array 12kW (@ 24V):	100W (@ 48rpm)*	30W	1.2W@24V

Frequency
Transmitter frequency: 12kW radar 9420 ± 20 MHz. All other radar 9405 ± 20 MHz

Environmental
Operating temperature range: -10°C – +55°C
Non operating temperature range:-20°C – +70°C
Humidity: Up to 95%
Waterproofing standard: IPX6

Resolution
256 colours (Digital Only)

All specifications are subject to change without prior notice.

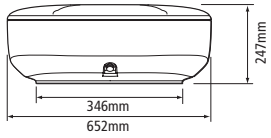
ORDERING INFORMATION

Digital Radomes
E92130 RD418D 4kW 18" Digital Radome (no cable)
E92132 RD424D 4kW 24" Digital Radome (no cable)

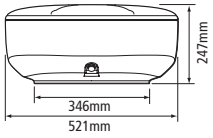
HD Color Radomes
E92142 RD418HD 4kW 18" HD Color Radome (no cable)
E92143 RD424HD 4kW 24" HD Color Radome (no cable)

HD Colour and Super HD Color Open Arrays
T52071 RA1048D 4kW 48" HD Color Open Array (15m cable) System
T52074 RA1072D 4kW 72" HD Color Open Array (15m cable) System
T52085 RA1048SHD 4kW 48" Super HD Color Open Array (15m cable) System
T52087 RA1072SHD 4kW 72" Super HD Color Open Array (15m cable) System
T92168 RA3048HD 12kW 48" HD Color Open Array (15m cable) System
T92169 RA3072HD 12kW 72" HD Color Open Array (15m cable)
T52086 RA3048SHD 12kW 48" Super HD Color Open Array (15m cable)
T52088 RA3072SHD 12kW 72" Super HD Color Open Array (15m cable)
E52069E 4kW Pedestal Component HD Color (includes VCM100)
E52081E 4kW Pedestal Component Super HD Color (includes VCM100)*
E92160E 12kW Pedestal Component HD Color (includes VCM100)
E52082E 12kW Pedestal Component Super HD Color (includes VCM100)
E52083 48" Open Array Antenna HD Color
E52084 72" Open Array HD Color
E52092 48" Open Array Antenna HD Color
E52093 72" Open Array Antenna Super HD Color

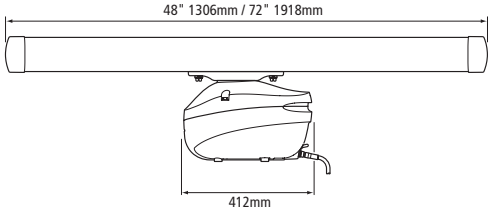
* Includes 48rpm and bird mode



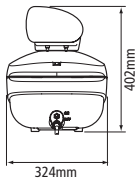
24" Radome



18" Radome



48" and 72" Radome



48" and 72" Radome

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Sonar

ClearPulse ▸ ClearPulse CHIRP

INNOVATION • QUALITY • TRUST

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ClearPulse CHIRP Sonar imaging. The difference is clear to see!

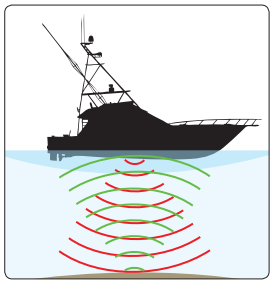
Raymarine's new CP450C brings the benefits of Raymarine's award winning ClearPulse CHIRP sonar technology to Raymarine multifunction displays and software.

ClearPulse CHIRP technology minimises surface clutter and water column noise, revealing more fish. It also delivers the most life-like bottom structure presentation without the need for manual tuning or adjustments. The operation is truly "hands-off."

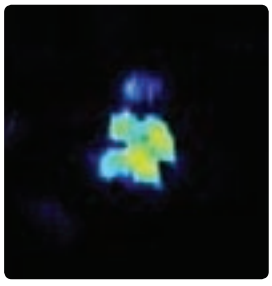
ClearPulse CHIRP processing marks individual bait fish and game fish, even when tightly packed together, or stacked vertically and visually separates bottom dwelling fish from the ocean bed/floor.

No matter what you fish for, no matter where they hide, CHIRP has the capability to detect and target the fish you want to catch.

Conventional Sonar

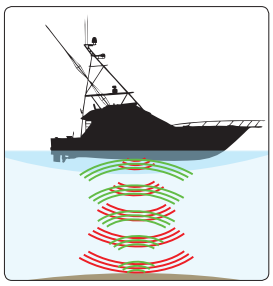


Conventional Sonar listens to a single frequency



Conventional Sonar targets can merge into one target.

ClearPulse CHIRP Sonar



ClearPulse CHIRP listens to a wider spectrum

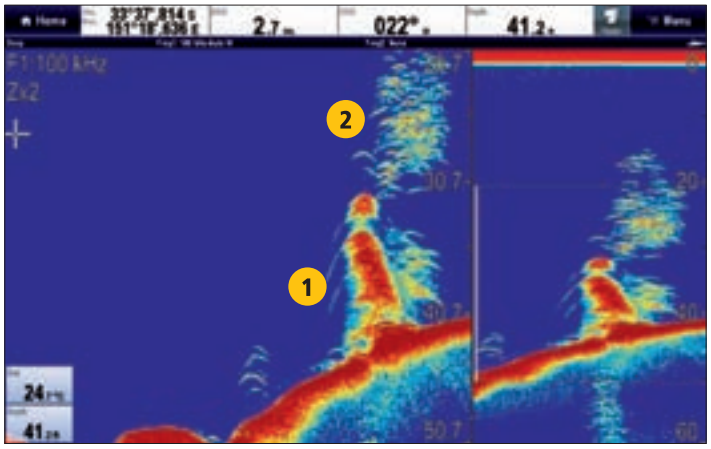
ClearPulse CHIRP reveals much greater detail.

clear pulse™

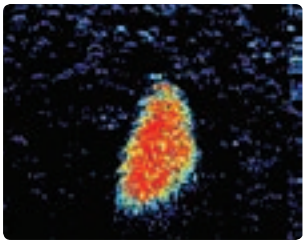
CP450C CHIRP Broadband Sonar Features

The CP450C with ClearPulse CHIRP technology goes beyond high definition and offers increased resolution and deeper depths.

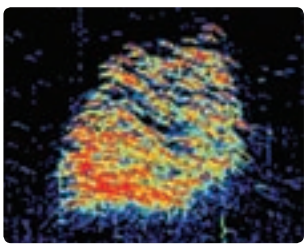
- TruZoom™ mode for a precise magnified view of fish targets, bottom structure and baitfish without any loss of resolution seen with traditional sonar.
- High-speed scrolling (Fast Pulse Rate) with 80 pulses a second and enhanced shallow water and high-speed operation.
- SeaTalk*hs* Ethernet network port – new waterproof Raynet connector.
- Network compatible with all new a, c and e Series MFDs and future Raymarine network multifunction displays.
- Dual CHIRP channels – 2 independently adjustable channels (two sonars in one). Each channel can be customised to specific frequency bands along with independent manual and auto adjustment settings.
- Low, medium and high frequencies for excellent performance at all depths – supports CHIRP transmissions from 25 to 255kHz with additional exclusive mid-band frequency support in the 75 to 130 kHz range.



Clearly identify bait fish (1) from their predators (2) even when packed tightly together, or stacked vertically.



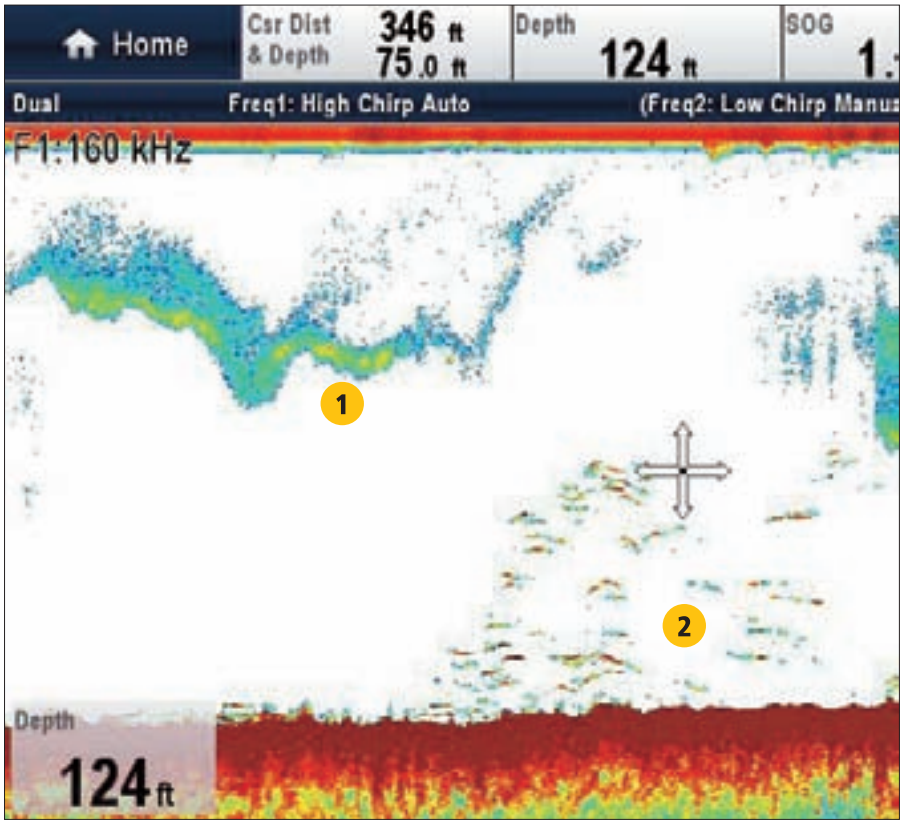
Low Frequency performance allows you to see fish at greater depths.

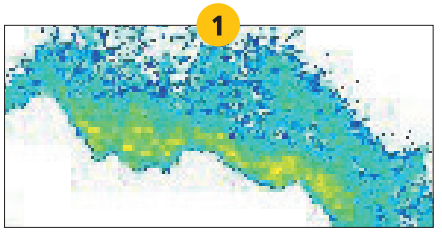


ClearPulse CHIRP TruZoom offers a precise magnified view without loss of resolution.

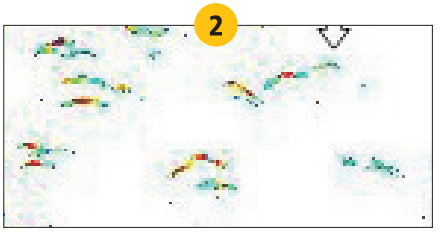
Images and content for illustration purposes only.

ClearPulse CHIRP – CP450C Sonar Module

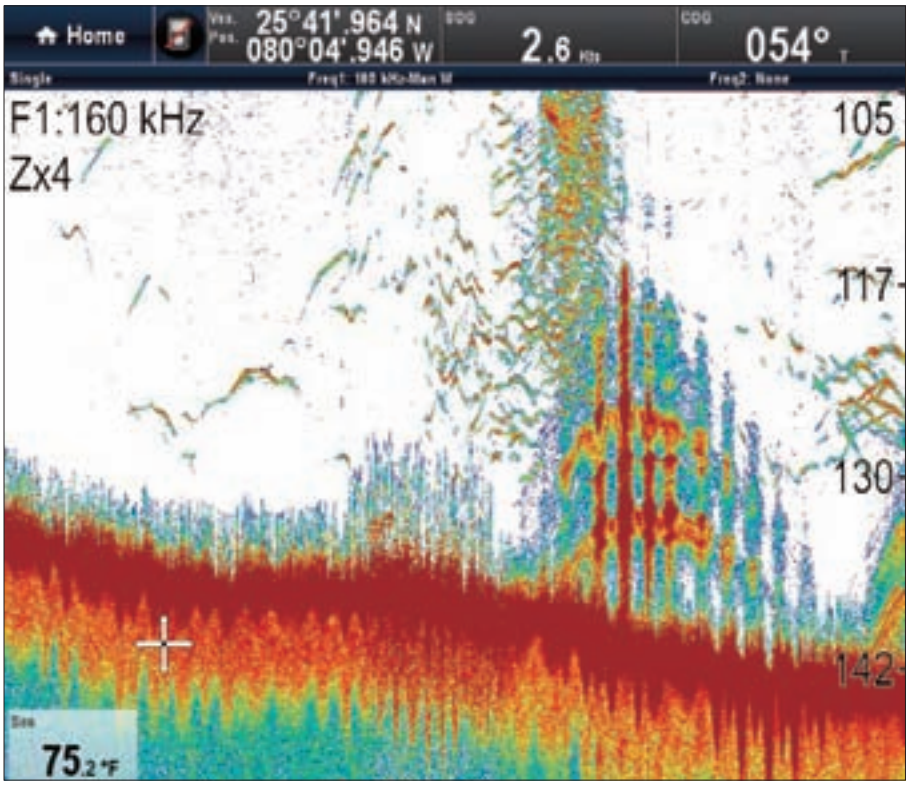




Bait fish. Easily identify different species. Here bait fish are clearly visible.



Predators. Predatory tuna fish identified below the schoals of bait fish towards the seabed.



Sonar for Coastal and Inland Fishermen

DSM30 ClearPulse

The DSM30 is the ideal choice for the coastal and inland fishermen. The DSM30 Digital Sonar Module features Raymarine ClearPulse sonar technology, dual frequency (50/200kHz) and 600 Watts of output power.

Sonar for Offshore Anglers

DSM300 ClearPulse

The DSM300 is the perfect choice for offshore anglers. With up to 1kW of output power (depending on choice of transducer) the DSM300 Digital Sonar module features Raymarine ClearPulse sonar technology and dual frequency (50/200kHz) operation.

The Ultimate Recreational Sonar Module

CP450 ClearPulse with CHIRP

The CP450C with ClearPulse CHIRP technology goes beyond high definition and offers increased resolution and deeper depths.

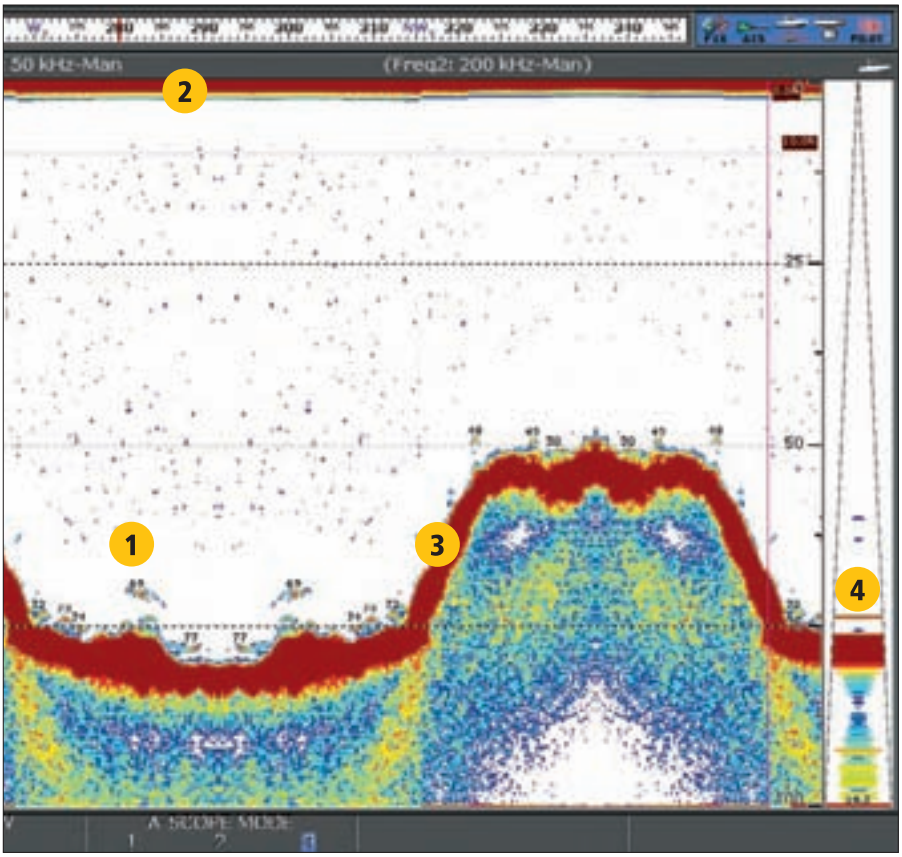
ClearPulse Sonar Modules – DSM30/DSM300

Target Fish. Thanks to ClearPulse technology, anglers can easily identify individual species of fish and their habitat at a glance and distinguish bait fish from larger species.

A-Scope and bottom coverage. See fish and the seabed in real time – A-Scope technology instantaneously displays the echoes found in the transducer's acoustic beam. Using the patented bottom coverage feature, you can easily see the size of the area of seabed covered by the transducer cone.

Bottom lock. Has the unique ability to smooth out the seabed presentation and is very useful if you are looking for fish that live close to the ocean floor. It gives greater magnification of fish echo returns directly above the seabed, helping you differentiate structure from fish.

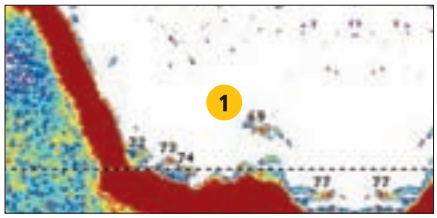
Zoom. Use auto zoom to help you find fish and their habitat close to the bottom, or select manual zoom for a detailed view of fish closer to the surface. Pinpoint fish echoes with x2, x3 and x4 zoom magnification.



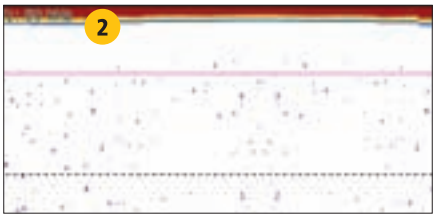
DSM30/DSM300 Sonar features

- Raymarine's patented ClearPulse sonar technology via a remotely mounted Digital Sonar Module.
- Hands-free ClearPulse technology automatically adjusts more than 220 sonar parameters per second and virtually eliminates clutter.
- ClearPulse adaptive receiver technology precisely targets fish and bottom structure with amazing clarity.
- Bottom lock, A-Scope and Zoom modes.
- Auto adaptive control of sensitivity, pulse rate and transmit power.
- Four sonar presets for one touch access to your favourite views of split screen, frequency, zoom, bottom lock and more.
- Bottom structure and target detail are delivered in native resolutions up to 1280 x 1024 pixels.
- Automatic "hands off" operation for a dramatically clearer picture.
- Full range of high and ultra high performance transducers available.

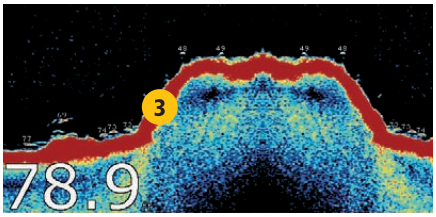
Individual targets. Targets are identified individually so you can pick out big fish from bait fish.

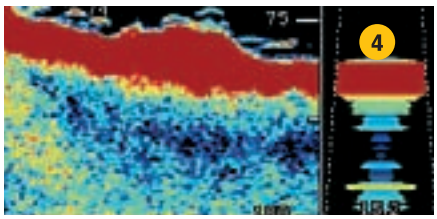


Eliminate Clutter. ClearPulse eliminates surface clutter for superior performance.

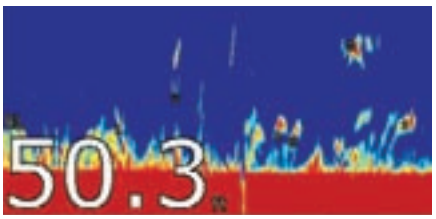


View the sea bed. ClearPulse enables you to view the sea bed clearly and in great detail.

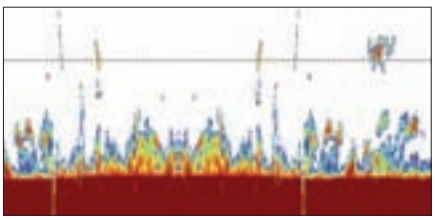




A-Scope. See fish echoes and bottom returns in real time with the A-Scope feature.

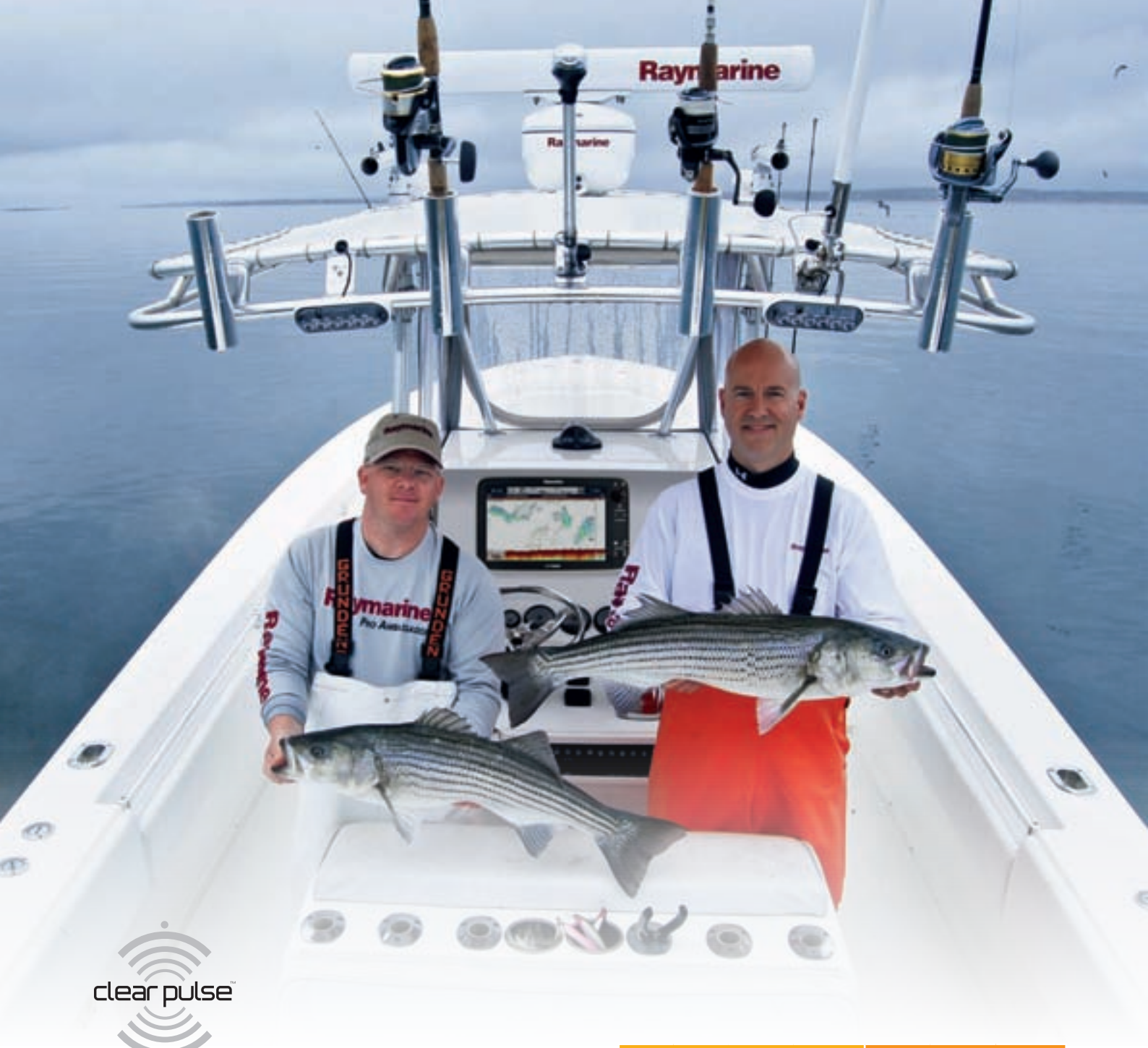


Zoom. x2, x3, x4 zoom for enlarged view of targets.



Bottom Lock. Flattens the seabed so that objects on or just above are easier to see.

For further product information, visit our website **www.raymarine.com** or contact your nearest Raymarine stockist.



clear pulse™

	MFDS WITH BUILT-IN CLEARPULSE AND DIRECT CONNECTION TRANSDUCERS (SEE RAYMARINE.COM FOR DETAILS)				DEDICATED SONAR MODULES		
					CLEARPULSE		CHIRP
FEATURES	**a67**	**e7D**	**c97/e97**	**c127/e127**	**DSM30**	**DSM300**	**CP450C**
Dual frequency 200/50kHz operation	●	●	●	●	●	●	
Multiple operation frequencies							25–255kHz
Operating voltage	12V	12V	12V/24	12V/24	12V	12/24V	12/24V
Power output (depends on transducer used and a strong and consistent power supply)	600W	600W	600W	600W	600W	600W/1kW	600W/1kW
Infinite automatic receiver bandwidths for adapting to all types of sea and bottom conditions					●	●	●
Receiver technology for Auto Adaptive control of Sensitivity, Pulse rate and Transmit Power	●	●	●	●	●	●	●
Compatible with ultra high-performance transducers (inc. broad bandwidth) and widebeam						●	●
Compatible with C Series Classic multifunction single station displays					●	●	
Compatible with C Series Widescreen multifunction network displays					●	●	
Compatible with E Series Classic multifunction network displays					●	●	
Compatible with E Series E90, E120 and E140 Widescreen multifunction displays					●	●	
Compatible with on a, c and e Series MFDs multifunction network displays					●	●	●
Compatible with Glass Bridge premier navigation system					●	●	
CHIRP Technology							●

Images and content for illustration purposes only.

Transducers

Choosing the right transducer for your sonar depends on; type of boat, hull design and usage. Through-hull with fairing blocks offer best performance, especially at higher speeds. Through-hull flush mounts are best for trailer boats where good performance is required and there are no protrusions from the hull. These are available in 0°, 12° and 20° tilt angles to accommodate various hull dead rises. In-hull transducers do not penetrate the hull, but do sacrifice some performance. Other parameters include matching the transducer's maximum power capability to the sonar's maximum power output: a 1kW sonar should be used with a 1kW transducer, although a lower power sonar can be used with a transducer that accepts more power for increased performance. Typically, larger transducers feature more ceramic elements that provide better performance regardless of the sonar.

ClearPulse Transducers

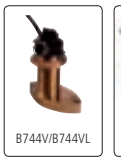
CLEARPULSE TRANSDUCERS							
PART NO.	MODEL	MATERIAL	FEATURES			PERFORMANCE	MAX POWER
			DEPTH	SPEED	TEMP		
Transom Mount Transducers							
E66054	P66	Plastic	•	•	•	Good	600 W
E66019	ST69	Plastic		•	•	–	–
E66084	TM258	Plastic	•		•	Good	1 kW
In-Hull Transducers							
E66008	P79	Plastic	•			Good	600 W
A66089	M260	Plastic	•			Excellent	1 kW
E66076	R199	Plastic	•			Ultimate	2 kW
Through-hull Transducers							
A66091	B744V	Bronze	•	•	•	Good	600 W
A66092	B744VL	Bronze	•	•	•	Good	600 W
E66013	P319	Plastic	•			Good	600 W
E66014	B117	Bronze	•			Good	600 W
E66082	B258	Bronze	•		•	Excellent	1 kW
A102121	SS270 Wide Beam	Stainless	•		•	Excellent	1 kW
E66079	B260	Bronze	•		•	Excellent	1 kW
E66075	R99	Plastic	•		•	Ultimate	2 kW
E66071	P120-ST800	Plastic		•	•	–	–
E66072	B120-ST800	Bronze		•	•	–	–
E66077	P319	Plastic	•		•	Good	600 W
Tilted Element Through-Hull Transducers							
E66085	B60-20°	Bronze	•		•	Good	600 W
E66086	B60-12°	Bronze	•		•	Good	600 W
A102137	B164-0°	Bronze	•		•	Excellent	1 kW
A102112	B164-12°	Bronze	•		•	Excellent	1 kW
A102113	B164-20°	Bronze	•		•	Excellent	1 kW

P66

P79

R199/M260

B60


B744V/B744VL

R99

SS270/B260/ B258/B744V/ B744VL

P120-ST800

P319

B117

B120-ST800

P319

CP450C CHIRP Transducers

In Hull Dual Element CHIRP Transducers (Must be installed as a pair connected using a 'Y' cable to the CP450C: Low/High or Low/Med or Med/High pairs)

	M265LH	M265LM	R111LH	R111LM	R599LH	R599LM	TM265LH	TM265LM
Max Power	1 kW		2 kW		2 to 3 kW		1 kW	
Transducer construction	Plastic/Urethane		Urethane housing		Epoxy housing		Urethane housing, stainless steel bracket	
Hull type	Fibreglass						Fibreglass, wood or metal	
Sensors	Depth only						Depth and fast response water temp	
Cable length	9m (30')							
Low frequency	40-75 kHz	40-75 kHz	38-75 kHz	38-75 kHz	28-60 kHz	38-75 kHz	42-65 kHz	42-65 kHz
Medium frequency		80-130 kHz		85-135 kHz		80-130 kHz		85-135 kHz
High frequency	130-210 kHz		130-210 kHz		130-210 kHz		130-210 kHz	
Beam width low frequency	32° to 21°	32° to 21°	19° to 10°	19° to 10°	23° to 9°	23° to 9°	25° to 16°	25° to 16°
Beam width medium frequency		24° to 16°		19° to 10°		13° to 8°		11° to 16°
Beam width high frequency	15° to 9°		8° to 4°		8° to 4°		10° to 6°	
Transducer bandwidth	115 kHz	85 kHz	117 kHz	87 kHz	112 kHz	82 kHz	103 kHz	73 kHz
Broadband ceramics	8		16		25		8	
Part Number	**A80012**	**A80038**	**A80133**	**A80134**	**A80212**	**A80213**	**A80013**	**A80041**

Through Hull Single Tilted Element CHIRP Transducers

	B75L		B75M			B75H			B175L			B175M			B175H		
Max Power	600 W											1kW					
Transducer construction	Bronze housing																
Hull type	Fibreglass or wood																
Sensors	Depth and fast response water temperature																
Cable length	9m (30')																
Tilt angle	0°	12°	0°	12°	20°	0°	12°	20°	0°	12°	20°	0°	12°	20°	0°	12°	20°
Low frequency	40-75 kHz								40-60 kHz								
Medium frequency			80-130 kHz									85-135 kHz					
High frequency						130-210 kHz									130-210 kHz		
Beam width	32° to 21°		24° to 16°			15° to 9°			32° to 21°			24° to 16°			15° to 9°		
Transducer bandwidth	35 kHz		50 kHz			80 kHz			20 kHz			50 kHz			80 kHz		
Broadband ceramics	1		1			1			7			1			1		
Part Number	**A80016**	**A80033**	**A80017**	**A80034**	**A80036**	**A80018**	**A80035**	**A80037**	**A80042**	**A80045**	**A80048**	**A80043**	**A80046**	**A80049**	**A80044**	**A80047**	**A80050**

CP450C CHIRP transducers Continued on back cover…

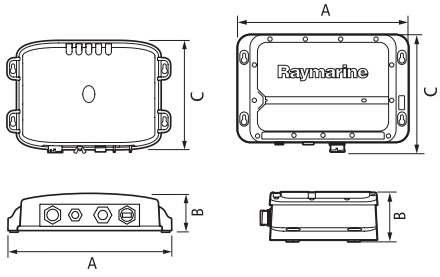
CP450C CHIRP Transducers (continued)

Through Hull Dual Element CHIRP Transducers (Transducers connect directly to the CP450C)								
	B765LH	**B765LM**	**B265LH**	**B265LM**	**R109LH**	**R109LM**	**B509LH**	**B509LM**
Max Power	600 W		1 kW		2 kW		2–3 kW	
Broadband ceramics	2		8		16		25	
Transducer construction	Bronze housing		Urethane housing with stuffing tube		Epoxy housing with stuffing tube			
Hull type	Fibreglass or wood				Fibreglass, wood or metal			
Sensors	Depth and fast-response water temperature							
Retrofit	–		Can retrofit existing B260		Can retrofit existing R99		Can retrofit existing R209	
Cable length	9m (30')							
Low frequency	40–75 kHz	40–75 kHz	42–65 kHz	42–65 kHz	38–75 kHz	38–75 kHz	28–60 kHz	28–60 kHz
Medium frequency		80–130 kHz		85–135 kHz		80–130 kHz		80–130 kHz
High frequency	130–210 kHz		130–210 kHz		130–210 kHz		130–210 kHz	
Beam width low frequency	32° to 21°	32° to 21°	25° to 16°	25° to 16°	19° to 10°	19° to 10°	23° to 9°	23° to 9°
Beam width medium frequency		24° to 16°		16° to 11°		13° to 8°		13° to 8°
Beam width high frequency	15° to 9°		10° to 6°		8° to 4°		8° to 4°	
Transducer bandwidth	115 kHz	85 kHz	103 kHz	73 kHz	117 kHz	87 kHz	112 kHz	82 kHz
Part Number	**A80014**	**A80015**	**A80010**	**A80011**	**A80039**	**A80040**	**A80210**	**A80211**

SPECIFICATIONS

Nominal voltage: DSM30 12V systems; DSM300 and CP450C 12/24V Systems
Absolute voltage range: DSM30 10.7 – 18V DC; DSM300 10.7 – 32 V DC
CP450C 10.2 – 32 V DC
Current consumption: 0.5A (8.0A peak – CP450C 6.0 A peak)
Frequency: DSM30 200kHz / 50 kHz ; DSM300 Dual 200 kHz / 50 kHz
CP450C 25 to 255 kHz
Nominal power output: DSM30: 600W; DSM300: 1000 or 600W; CP450C 1kW
Temperature range: DSM30/DSM300 -10°C to +50°C operating; -20°C to +70°C non operating; CP450C -20 to +50°C operating and -30° to +70°C non-operating
Humidity: up to 95%
Waterproofing standard: CFR46 and IPX6
Weights: DSM30 and DSM300 1kg (2.2lbs); CP450C 3.38lbs (1.54kg)
Dimensions (WxHxD): DSM30/DSM300: 10.7 x 2.4 x 7.4 in (20 x 60 x 190mm)
CP450C: 11.77 x 3.45 x 8.07 in (299 x 87.5 x 205mm)

Ordering Information
E63074 DSM30 600 Watt HD Digital Sonar Module
E63069G DSM300 1kW HD Digital Sonar Module
E102143 CP450C Chirp Sonar Module



	Dimensions		
	A	**B**	**C**
DSM30	273.3mm (10.7")	61.7mm (2.4")	187.2mm (7.4")
DSM300	273.3mm (10.7")	61.7mm (2.4")	187.2mm (7.4")
CP450C	299mm (11.77")	87.5mm (3.45")	205mm (8.07")

3

FREE WARRANTY UPGRADE FROM 2 YEARS TO 3 YEARS

Raymarine offers a 2 year Limited Warranty (upgradable to 3 years upon product registration) on products installed in vessel use classifications within this brochure, full details of the Global Warranty Policy and how to register your products can be found at **www.raymarine.com/warranty**. If you require local assistance, please contact a Raymarine certified dealer near you, details of which can be found at **www.raymarine.com/dealerlocator**.

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Raymarine Nederland T: (+31) (0) 26 361 4242	**Raymarine Norway** T: (+47) 69 264 600	**Raymarine Sweden AB** T: (+46) 317 633670

Safety Notice
Raymarine products are intended to be used as aids to navigation and must never be used in preference to sound navigational judgement. Their accuracy can be affected by many factors, including environmental conditions, equipment failure or defects, and incorrect installation, handling or use. Only official government charts and notices to mariners contain all the current information needed for safe navigation, and the captain is responsible for their prudent use. It is the user's responsibility to use official government charts, notices to mariners, caution and proper navigational skill when operating any Raymarine product.

Content Note
The technical and graphical information contained in this brochure, to the best of our knowledge, was correct as it went to press. However, the Raymarine policy of continuous improvement and updating may change product specifications without prior notice. Therefore, unavoidable differences between the product and this brochure may occur from time to time, for which liability cannot be accepted by Raymarine.

Specifications
All specifications are subject to change without prior notice. Visit **www.raymarine.com** for the most up-to-date specifications. Some images are for illustration purposes only.

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Photography.
The lifestyle photography used in this brochure is courtesy of: Cruisecraft.

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Raymarine®
A FLIR COMPANY

LIT70063

Thermal Cameras

Fixed and Handheld Night Vision Helping to Keep You Safe

INNOVATION • QUALITY • TRUST

Raymarine®

How Thermal Night Vision Cameras Help Keep You Safe

Turn Night into Day

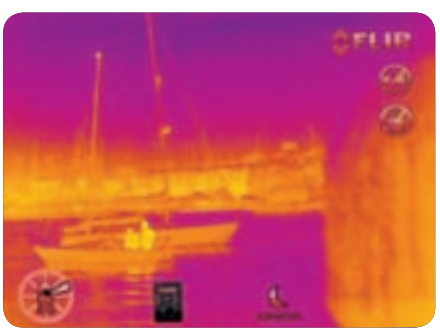
- Safer navigation
- Life-saving potential in man-overboard situations
- Enhanced visibility and situational awareness at night
- Easy docking in low light
- Iceberg detection and avoidance
- Boat security and surveillance

Navigation and Collision Avoidance. Thermal night vision cameras make navigation safer with clear video that helps you to see hazards like buoys, floating debris, rocks, land, bridges, and other vessels night and day. Thermal night vision cameras from Raymarine are easy to use, and require no training. The images speak for themselves.

Man Overboard. Thermal night vision cameras can help you find a person in the water faster than any other night vision technology. Thermal cameras are used by Coast Guards, Police Agencies, Search and Rescue teams and Militaries around the world.

Easy to Use. Thermal night vision cameras from Raymarine are easy to use, and require no training. The images you get from thermal night vision cameras are intuitive and easy to understand. If you can watch TV, you can use a Raymarine thermal night vision camera.

Complements other On-board Electronics. Raymarine's thermal night vision cameras complete your electronics suite: GPS and chart plotters tell you where you are and where you going; radars alert you to nearby vessels; but nothing lets you see what's out there like a Raymarine thermal night vision camera.



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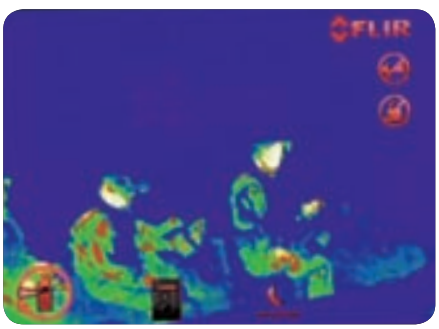
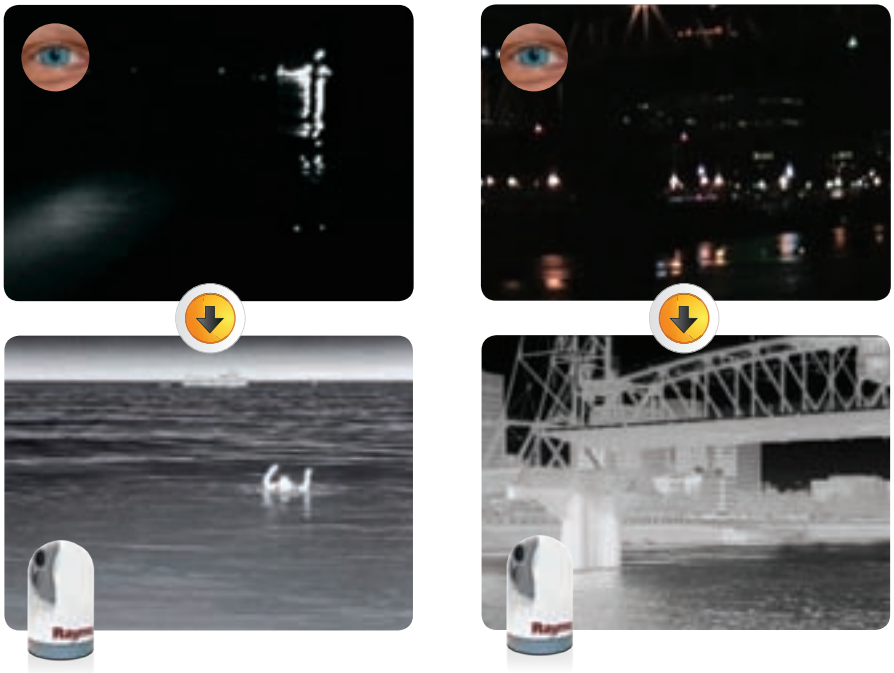
TH-Series Handheld Thermal Night Vision

The new Raymarine TH Series Thermal Cameras gives boaters the power to see clearly in total darkness. Both models use the same proven FLIR thermal imaging technology as Raymarine's premium T Series fixed mount thermal night vision systems, but in a compact, handheld easily accessible format.

TH Series Thermal Cameras make pictures from heat, not light, helping you see landmarks, obstructions, and other vessels clearly in all light conditions from direct sunlight to complete darkness. Thermal night vision improves your ability to see rocks, buoys, floating debris, and even helps you find people in the water, vital when just a few minutes makes all the difference in the matter of survival.

	TH24	TH32
Simple three-button operation	●	●
Rugged all-weather design	●	●
Long-life rechargeable Li-Ion battery	●	●
LED Task light	●	●
Resolution (pixels)	240 x180	320 x 240
24° x 18° Field of view	●	●
2× digital zoom		●
Freeze frame	●	
IP-67 rated	●	●
Part Number	**E70032**	**E70033**





NEW

Slew-to-Cue Target Tracking

Slew-To-Cue improves situational awareness and safety by allowing the thermal camera to automatically keep "cued" targets in view at all times.

Chart Object Slew-to-Cue
Touch the display (cue) and the thermal camera automatically moves to the cursor position (slew), allowing you to keep chart objects like buoys or obstructions in constant view.

Auto Slew to AIS and MARPA Targets
T Series cameras and Raymarine MFDs can Auto Slew to dangerous MARPA and AIS targets, keeping dangerous targets in the camera's sight during limited visibility situations.

MOB Auto Slew
The MFD and thermal camera will Auto Slew to a Man Over Board alarm location, maintaining the Man Over Board position in view at all times during a rescue situation.

T Series Thermal Cameras

Raymarine's T Series thermal night vision camera systems use cutting-edge Ethernet connectivity for easy installation, control, and interface with other on-board electronics. The rugged, waterproof gimbal enclosure provides a continuous 360° pan and ±90° tilt for an all round view.

Standard Features

- Short to medium range
- Full 360° pan and ± 90° tilt capability
- Integrated multifunction display control
- Thermal only or Thermal / lowlight multi sensor configurations - see comparison table
- Standard and high-resolution thermal night vision camera options
- Network ready
- Rugged, fully marinized construction to withstand harsh conditions
- Window de-ice heaters for clear vision even in ice and snow
- Proprietary, patent-pending image enhancement algorithms; Digital Detail Enhancement (DDE) to bring out faint image details that you might otherwise miss
- Standard NTSC or PAL video outputs that can be viewed on any monitor with an auxiliary video input
- Pre-set gain adjustments for optimal image quality in various conditions
- On-screen icons show what the camera is doing and where it's pointing

	T SERIES COMPARISON CHART											
	T300 SERIES – SINGLE THERMAL CAMERA				T400 SERIES – DUAL CAMERA THERMAL AND LOW LIGHT							
	T300	T303	T350	T353	T400	T403	T450	T453	T460	T463	T470SC	T473SC
Thermal video	●	●	●	●	●	●	●	●	●	●	●	●
Low light video					Black and White						Colour	
Video resolution	320x240		640x480		320x240		640x480					
Frame refresh rates	9Hz	30Hz	9Hz	30Hz	9Hz	30Hz	9Hz	30Hz	9Hz	30Hz	9Hz	30Hz
Pause, rear view, surveillance mode	●		●	●	●	●	●	●	●	●	●	●
Field of view	24°		25°		24°		25°		12°		18° x 14°	
Digital zoom	2×						2× and 4×					
Gyro stabilised											●	●
Focal length	19mm		25mm		19mm		25mm		50mm		35mm	
Part Number	E32125	E32145	E32126	E70054	E32127	E32128	E32129	E70055	E70056	E70057	T70118	T70119

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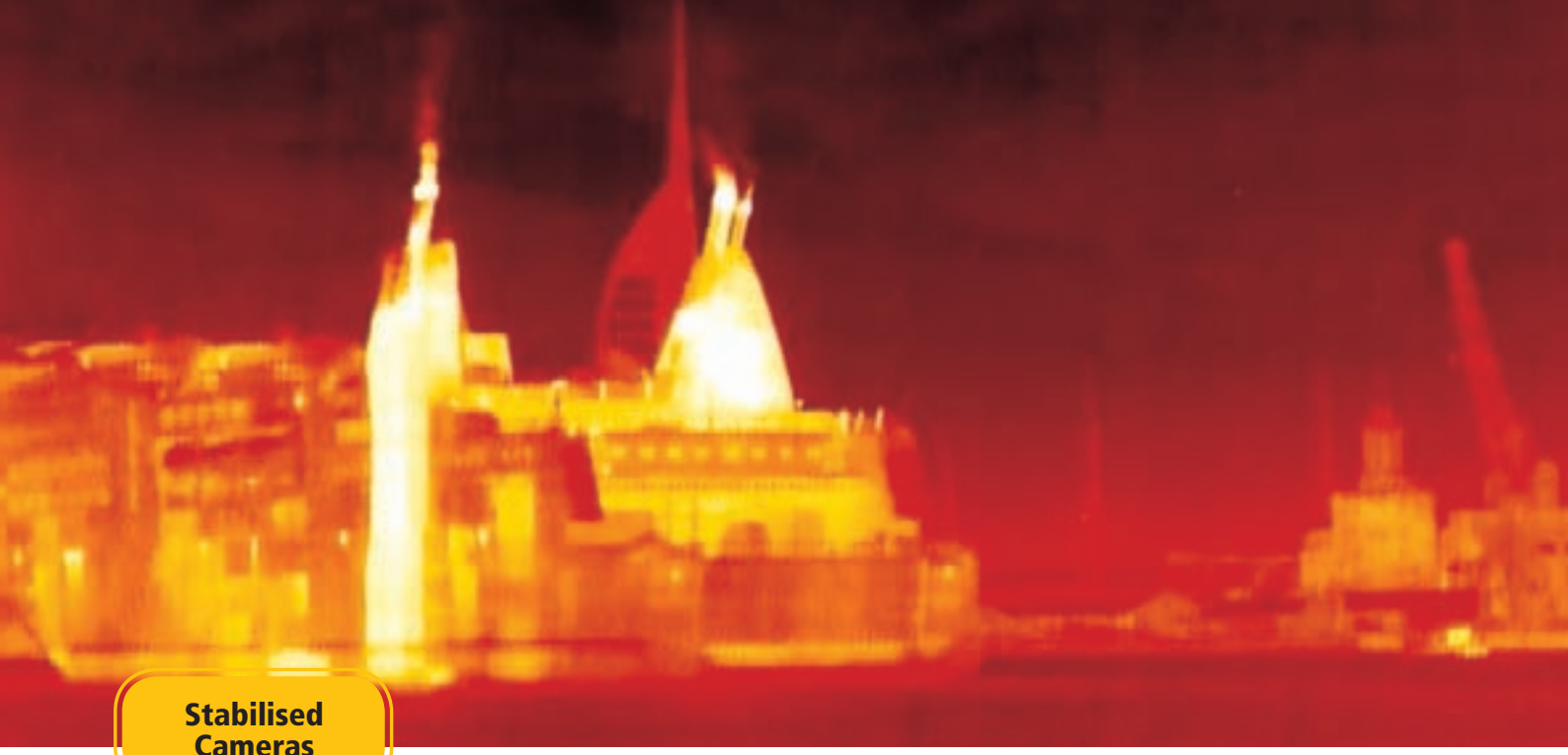
Range and Detection

Raymarine thermal night vision cameras create pictures using thermal energy. Everything that is warmer than absolute zero (-273º celsius) generates thermal energy, even ice! Although this energy is invisible to the naked eye, Raymarine thermal night vision cameras detect it and turn it into video that is easy to understand, allowing you to see more and see further than you could with your eyes.

The range at which Raymarine thermal night vision cameras detect objects is shown in the graphics (right). However, actual object detection range performance may vary depending on camera set-up, environmental conditions, user experience and the type of display used.

TH Series Range and Detection



Stabilised Cameras

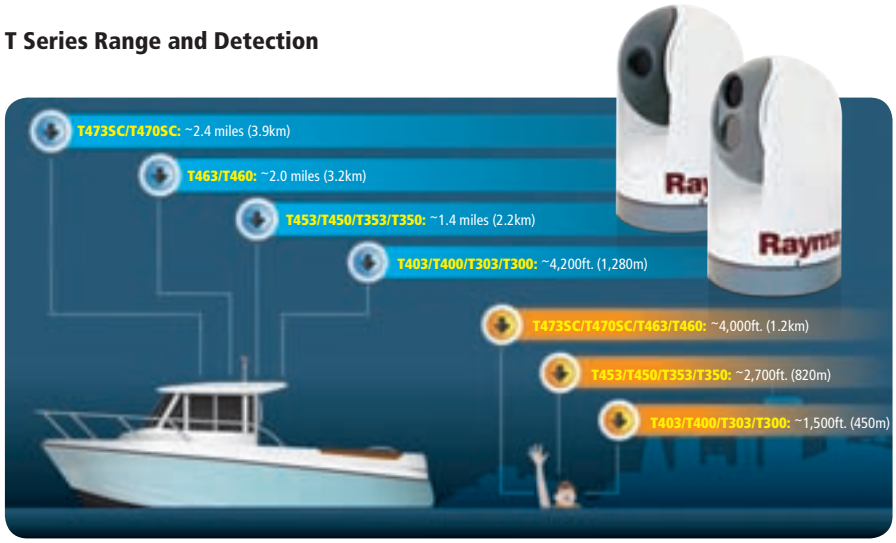
T470SC/T473SC Professional Thermal Cameras

The choice of professional mariners, the T470SC and T473SC offer premium imaging performance combined with state of the art 2 axis gyro stabilisation. These rugged cameras are equipped with high resolution 640 x 480 thermal sensors and a full color low light video camera provides enhanced situational awareness in all conditions.

- Active gyro-stabilization provides steady imagery when seas are rough
- Extreme low light color visible camera with 10x zoom is ideal for positively identifying targets in daytime or low light conditions
- 35mm thermal lens for extended range performance. Detect small vessels from over 2 nautical miles away, giving you more time to see and avoid dangerous situations

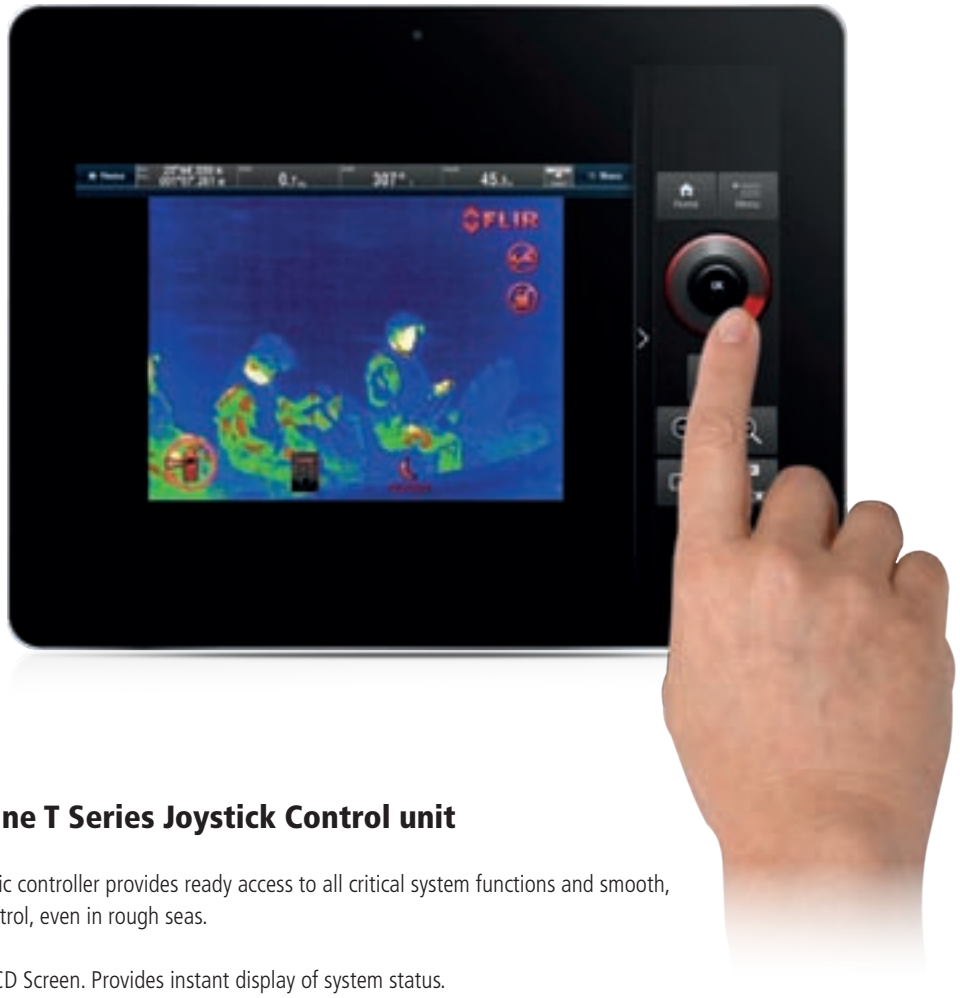
Gyro stabilised imager; target still in view despite bow rise and fall

T Series Range and Detection



Control with Raymarine Apps

RayControl transforms tablets into both a viewer and full function, 2-way control; the tablet syncs with the multifunction display and users touch the tablet screen to control the MFD. RayControl also features 'pop-out' virtual keypad mirroring the MFD's rotary controller and hard keys, enabling users to operate all available functions wirelessly and remotely. RayControl works with all of Raymarine's new e Series and c Series MFD's.



Raymarine T Series Joystick Control unit

The ergonomic controller provides ready access to all critical system functions and smooth, effortless control, even in rough seas.

- Heated LCD Screen. Provides instant display of system status.
- User-programmable "hot key". Gives operators instant access to frequently-used functions.
- Home. A programmable feature that lets users define a Home position as a reference they can use when navigating for long periods.
- Colour. Different display settings let the operator choose between two black and white or three colour display schemes that are easy on the eyes and help operators see better.
- Scene. Provides a variety of pre-set gain and level adjustments so that operators can get the best image quality possible throughout a wide range of conditions.
- Joystick. The sealed 8-way control knob provides precise control even in rough seas.
- Ethernet connectivity. Install multiple control stations around your vessel so you can control the T Series thermal night vision cameras from anywhere you want on board.

Camera Control via HybridTouch Displays

T Series thermal night vision cameras seamlessly integrate with Raymarine HybridTouch displays (MFD's). Using SeaTalk^{hs} networking, the camera's pan, tilt and zoom controls can be actuated by touch screen or the MFD's keypad and rotary controls. A thermal camera application is available right from the MFD's home screen. The application can be displayed full-screen, or in a window alongside other navigation data such as electronic charts or radar.

The camera system's controls are available at any HybridTouch display on the boat, allowing skippers to navigate with thermal imagery from the main helm or a remote navigation station. The T Series pan, tilt and zoom controls are also compatible with the HybridTouch user interface.

T SERIES SPECIFICATIONS

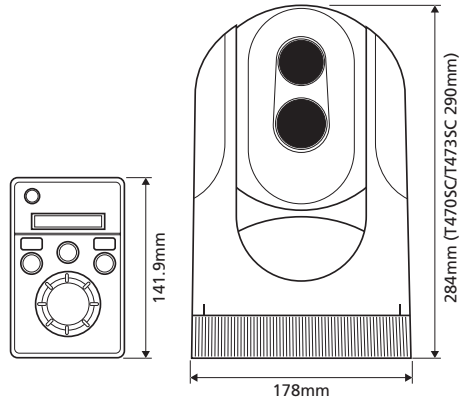
Video resolution: see comparison table
Field of view: see comparison table
Digital zoom: see comparison table
Low light video: see comparison table
Focal length: see comparison table
Power consumption: 25W nominal; 50W maximum
Power requirements: 12 VDC to 24 VDC (-10% / +30%)
Connector types: F Type Connector with F to BNC adaptor included for video out
Video output: NTSC or PAL
Pan/tilt coverage: 360° continuous pan, ± 90° tilt
Stabilisation: T470SC and T473SC only
Weight: ~ 4.1kg (9lb) except T470SC/T473SC 5.2kg (11.5lbs)
Size (dia x height): 178mm x 284mm except T470SC/T473SC 178 x 290mm
Operating temperature range: -25°C to +55°C
Storage temperature range: -40°C to +85°C

Note: All specifications are preliminary and subject to change without prior notice.

TH SERIES SPECIFICATIONS

Video resolution: TH24: 240 x 180 TH32: 320 x 240
Focal length: 19mm
Field of view (H x W): 24° x 18°
Waveband: .5 to 13.5 µm
Freeze frame: TH24 only
Digital E-Zoom: TH32 only (2×)
Focus: automatic
Diopter adjustment: +2
USB port: for software updates/upgrades
Task light: LED
Audible alert: Indicates camera on/function change
Built-in viewfinder display: colour VGA LCD display
Polarity/detection palettes: white hot; black hot; marine red
Video refresh rate: 9 Hz
Weight: 340g
Size (L x W x H): 172mm x 58.7mm x 62mm
Fixed use: standard tripod mount
Battery type: internal camera battery/Li-Ion
Battery recharging: USB cable for internal battery charging – charging cradle optional
Environmental: rating IP-67
Operating temperature: -20°C to 50°C (-4°F to 122°F)

Note: All specifications are preliminary and subject to change without prior notice.



3 FREE WARRANTY UPGRADE FROM 2 YEARS TO 3 YEARS

Raymarine offers a 2 year Limited Warranty (upgradable to 3 years upon product registration) on products installed in vessel use classifications within this brochure, full details of the Global Warranty Policy and how to register your products can be found at **www.raymarine.com/warranty**. If you require local assistance, please contact a Raymarine certified dealer near you, details of which can be found at www.raymarine.com/dealerlocator.

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Raymarine Nederland T: (+31) (0) 26 361 4242	**Raymarine Norway** T: (+47) 69 264 600	**Raymarine Sweden AB** T: (+46) 317 633670

Safety Notice
Raymarine products are intended to be used as aids to navigation and must never be used in preference to sound navigational judgement. Their accuracy can be affected by many factors, including environmental conditions, equipment failure or defects, and incorrect installation, handling or use. Only official government charts and notices to mariners contain all the current information needed for safe navigation, and the captain is responsible for their prudent use. It is the user's responsibility to use official government charts, notices to mariners, caution and proper navigational skill when operating any Raymarine product.

Content Note
The technical and graphical information contained in this brochure, to the best of our knowledge, was correct as it went to press. However, the Raymarine policy of continuous improvement and up-dating may change product specifications without prior notice. Therefore, unavoidable differences between the product and this brochure may occur from time to time, for which liability cannot be accepted by Raymarine.

Specifications
All specifications are subject to change without prior notice. Visit **www.raymarine.com** for the most up-to-date specifications. Some images are for illustration purposes only.

Trademarks
For a list of trademarks, please refer to our website www.raymarine.com

Note: *Equipment described herein may require US Government authorisation for export purposes. Diversion contrary to US law is prohibited.*

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LIT70062

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Accessories

AIS ▸ VHF Communications ▸ Satellite TV ▸ Software

INNOVATION • QUALITY • TRUST

Raymarine®

VHF Communications

Raymarine's communications systems combine innovative, state-of-the-art technology with rugged waterproof construction, designed to withstand life at sea. Select the right VHF radio for your boat – single or multi-station VHFs, Class D DSC (Digital Selective Calling) and NMEA connectivity. Whether blue water cruising or fishing inshore, Raymarine has what you need for communication safety at sea.

What is Digital Selective Calling?

Digital Selective Calling (DSC) is a global protocol that uses channel 70 (156.525 MHz) to transmit and receive digital messages. It works on DSC equipped VHF radios and is used for individual, 'all ships' and distress calls. DSC also enables you to selectively alert single or multiple boaters of incoming VHF calls by using stored MMSI (Maritime Mobile Service Identification) numbers, similar to making a phone call.

You can also 'poll' another boat to obtain its GPS position and display it on a Raymarine multifunction display.

DSC safety digital Mayday

If you are unfortunate enough to find yourself having to make a mayday call, the last thing you need is extra complication. Making a DSC distress call is simple with Raymarine's DSC equipped VHFs. Just press the button, clearly marked in the back of the handset or front panel of the radio, and GPS position and time information are transmitted in a digital 'packet' complete with the vessel's Maritime Mobile Service Identification (MMSI) telling other ships and shore stations exactly where you are and that you are in a distress situation. This simple procedure can dramatically increase your chance of a successful rescue compared to a traditional Mayday voice call.

FEATURES	RAY218E	RAY55E	RAY49E
Class D DSC (Digital Selective Calling) transceiver	●	●	●
'DSE' NMEA sentence for 3 decimal position precision	●	●	●
DSC Distress key transmits GPS position and a digital mayday	●	●	●
Dual and Tri Watch	●	●	●
Built-in Hailer with "Listen Back" capability and automatic fog horn	30 Watt		
NMEA 0183 input with GPS Position, COG and SOG display	●	●	●
Chartplotter position polling using NMEA 0183 output	●	●	●
Easy-to-use rotary controls for channel, volume, squelch and menu operation	●	●	●
Extra large dot matrix LCD	●	●	Segmented LCD
Speaker microphone with controls and remote mount option	●		
Dual Channel Display (2UP Mode) displays active channel and standby channel	●	●	
Programmable favorite channel soft keys (1UP Mode)	●	●	
Quick Access 16/Plus Key	●	●	●
4 Scan modes: All scan, saved (memory) scan, priority all scan and priority saved scan	●	●	●
Programmable Scanning	●	●	●
Submersible (IPX7 Standard)	●	●	●
Superior receiver with excellent intermodulation rejection	●	●	
Rugged housing with a low profile bezel using the optional flush mount kit	●	●	●
Optional Raymic remote station handset serves as full function second station	●	●	
External speaker output	●	●	●
NMEA 0183 input	●	●	●
Powered Loudspeaker with On/Off Switch			
Phone style handset with alphanumeric keypad			
Second station option	RayMic	RayMic	
ATIS (optional)	●	●	●

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Ray55E

Fixed mount full featured compact VHF. A compact powerhouse, the Ray55E VHF radio offers performance and style. Expand the Ray55E with the powerful Raymic remote handset.

Ray49E

Fixed mount ultra compact VHF. The Ray49E VHF is our most compact fixed mount DSC VHF radio. Ideal for smaller boats, the Ray49E features crystal clear audio and remote microphone controls.

Ray218E

Fixed mount high performance VHF.The Ray218E is Raymarine's premier fixed mount VHF radio with a long list of standard features. The Ray218E can be expanded with the optional Raymic remote handset that offers full function radio control and intercom from a remote on board station.

RAYMIC

Optional handset for Ray218E and Ray55E VHF radios. Provides a complete hand-held, full-function, second station or an intercom handset.

RAY430 Loudhailer

Ahoy there! The Ray430 loudhailer has eight foghorn signals, including an automatic foghorn when underway. Connect it to a vessel security system for an extra loud alarm siren if a sensor is activated, or add up to four remote intercom stations for complete onboard communications. 30 watts of output power means you will be loud and clear!

Raymarine AIS Receivers and Transceivers - See and be seen!

Operating in the VHF maritime band, the AIS (Automatic identification System) system enables the wireless exchange of navigation status between vessels and shore-side traffic monitoring centres. Commercial ships, ocean-going vessels and recreational boats equipped with AIS transceivers broadcast AIS messages that include the vessel's name, course, speed and current navigation status.

There are 3 different types of AIS systems: Class A, Class B and receive-only;

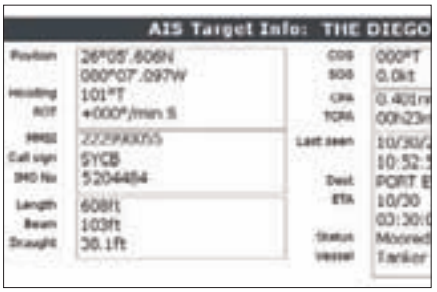
- Class A is a regulatory requirement for IMO/SOLAS commercial vessels; Class A transmits and receives the full set of AIS information.
- Class B systems provide less expensive AIS functionality for smaller commercial vessels and pleasure vessels that do not need to comply with IMO/SOLAS regulations. Class B uses lower transmission power and transmits a shortened or simplified set of AIS information at a slightly less frequent rate compared to Class A.
- Receive-only systems; inexpensive and low-powered, these systems only receive information from other vessels (whether transmitting using Class A or Class B) and do not transmit any information about the vessel on which they are installed.

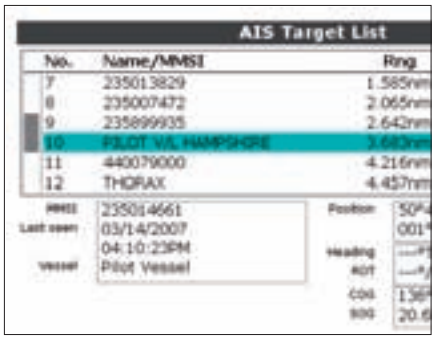
CLASS B

CLASS B

Tech Tip

Vessel Protection
As part of a suitably configured network, AIS enables owners to be alerted to unauthorised vessel movements.





AIS Target info and target list screens

AIS650 Transceiver

Class B AIS transceiver allowing you to transmit your data to other AIS equipped vessels, and receive and see their data on your Raymarine multifunction display's radar and/or chartplotter screen. The ultra-compact AIS650 is engineered for high performance and seamless integration with your Raymarine navigation system.

AIS350 Receiver Only

Dual-channel receive-only product designed for small boats wanting the increased situational awareness benefit of AIS, but without the need for Class B transmitting capability. This low cost alternative brings many of the safety advantages of AIS to a wider range of vessels than ever before.

AIS100 Splitter The AIS100 Splitter is an amplified splitter designed to receive AIS signals and VHF transmissions simultaneously from one antenna with minimal loss of signal.

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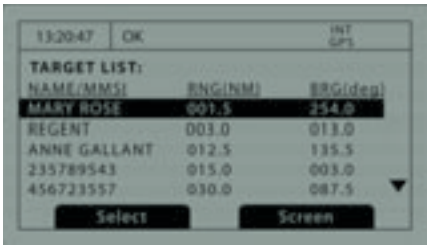
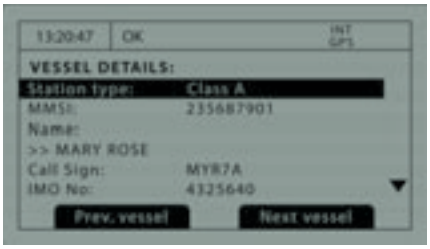




AIS950 target and vessel detail displays (simulated)

CLASS A

AIS950 Transceiver

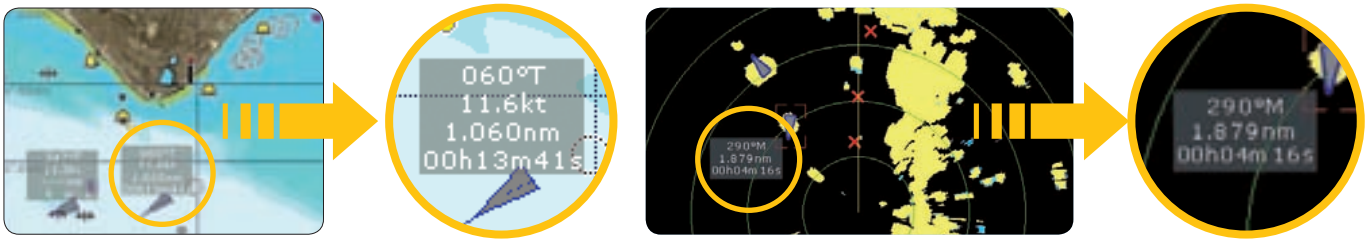
The AIS950 Class A receiver and transmitter is approved to deep sea and inland waterway* standards and offers a highly intuitive user interface.

- Fully compliant Class A AIS product in a single unit.
- Advanced radio communications technology.
- Class A engine delivers unrivalled performance and reliability.
- User menu provides easy access to all information.
- Large, high visibility mono-chrome LCD.

Port Management
AIS can be used as a highly effective port management tool allowing easy identification, control and direction of vessels.

Coastal Surveillance
AIS and radar can be used together to create effective and efficient coastal tracking, surveillance and safety systems.

Basic AIS Target Graphic on Raymarine MFDs
See basic AIS target information in both radar and chart modes. Graphics show heading, range and estimated time of arrival as well as a target arrow.



* Royalty costs apply

Satellite TV Antenna Systems

Raymarine's Satellite TV antennas bring the same combination of high performance and ease-of-use to your onboard entertainment that you would expect from your home entertainment system. Housed in a compact dome, our antenna systems automatically track and receive satellite TV signals in almost any conditions – guaranteed quick, clear, reliable access to hundreds of digital channels.

Better technology – better reception
Unique Wide Range Search (WRS) technology means Raymarine's antennas can identify and acquire satellite signals as quickly as possible. When you've got a fix on the satellite signal you want, the tracking algorithms will help ensure you keep it. They're built to cope with tough conditions, too. Dynamic Beam Tilting (DBT) continuously measures, and compensates for your vessel's heading, pitch and roll – keeping your antenna locked on a satellite for a clear picture, whatever the conditions.

Dual or Quad LNB
Connect multiple television receivers and tune in to different channels on each television – the Dual systems (33 and 37STV) allow the connection of two television receivers and the Quad systems (45 and 60STV) allow four.

	SATELLITE TV FEATURES			
	33STV	37STV	45STV	60STV
Dual or Quad LNB design for multiple receivers	Dual	Dual	Quad	Quad
DVB (Digital Video Broadcast) compatible	●	●	●	●
Dish diameter (cm)	33	37	45	60
Wide Range Search Algorithm for high speed search and fast satellite acquisition	●	●	●	●
Dynamic Beam Tilting (DBT) technology signal tracking in extreme weather and sea conditions	●	●	●	●
High Definition (HD) compatible	●	●	●	●
Enhanced signal reception and improved antenna gain for better performance in poor weather				●
NMEA 0183 GPS position input capability for reduced acquisition time	●	●	●	●
Conical scanning detects strongest satellite signal for enhanced stabilisation	●	●	●	●
Enhanced elevation angles to maintain satellite fix				●
Automatic LNB skew control			●	●
Rotating sub-reflector redirects signal for reduced dish movement and quieter operation	●	●	●	●
Suggested vessel size	20' – 25'	25' – 35'	35' – 50'	over 50'
Built in GPS		●	●	●
Tracks DUB-S2 or HD Transponders	●	●	●	●

Voyage Planner Software

Voyage Planner is a powerful, easy-to-use, home-planning and data management software solution designed for Raymarine multifunction displays (MFD). Voyage Planner allows you to effortlessly manage waypoints, routes and tracks between your vessel's MFD and your home planning PC. It also allows real-time import and export with a PC whilst onboard. You can sync wirelessly via SeaTalk^{hs} (Ethernet) or the internet via a WiFi or router equipped PC or laptop. Alternatively, you can use a micro SD card.

Voyage Planner imports and exports to Raymarine, GPX and KMZ formats.

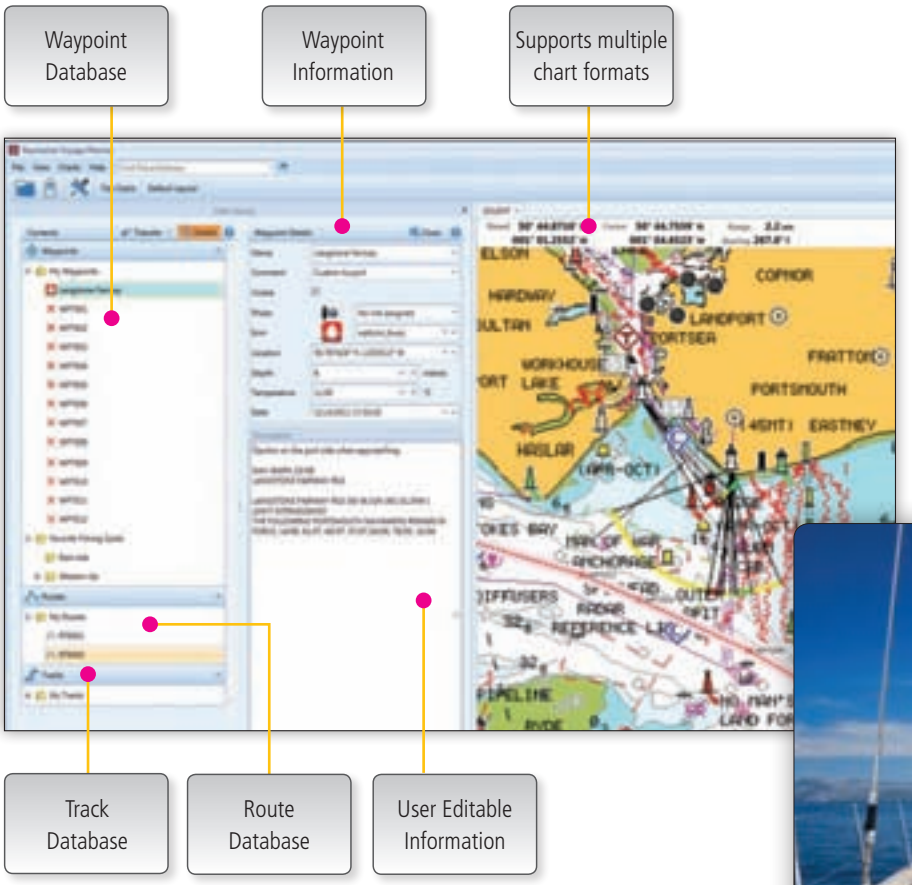
Core Features include:

- Intuitive and lightning fast waypoint, route creation and edits.
- Instant on-the-fly WiFi sync of waypoints and routes between your Raymarine MFD and Voyage Planner.
- Easy waypoint, route and track transfer via CF or microSD card.
- Multiple charts in tab or tile view.
- Distance and bearing tool.
- Link digital photos to the map.
- Depth soundings in feet or metres.

Choice of Cartography

- FREE Ready-to-Navigate cartography when you register an MFD with Ready-to-Navigate cartography embedded.
- Navionics Gold/Platinum+ and HotMap plug-n-play chart cards (No card reader required. Requires N-Tag enabled chart card).
- NV Digital, Solteknik, NOAA ENC and RNC charts of USA waters via free, automatic download.
- Extras include: GRIBs, Google Earth, TurboView.

VoyagePlanner



VoyageXChange

The Voyage XChange website enables you to store your waypoints and routes and share with friends on Facebook, purchase charts for use in your Raymarine MFD or Voyage Planner software, and more…

- Share routes and waypoints on Facebook.
- Purchase a wide range of charts for use with your MFD display or Voyage Planner software.
- Low-cost annual subscription – FREE 12 month access with the purchase of Voyage Planner software.

Raymarine Apps

Transform your smartphone, tablet or KIndle Fire into a remote viewer or controller! Using Raymarine MFDs with built-in Wi-Fi and Raymarine apps, you can simultaneously view and control all new Raymarine MFDs simultaneously, thanks to video streaming capability. View charts, sonar, radar, and thermal night vision from anywhere onboard, right in the palm of your hand. Connecting is easy! Just go to iTunes, Google Apps or Amazon to download and get started.

Raymarine VIEW | Raymarine CONTROL | Raymarine REMOTE

Available on the App Store

SPECIFICATIONS

AIS950
Operating voltage: 10.8 – 31.2 v DC
Average power consumption: < 12W
Transmitters: 1
Receivers: 2
Connectors: F - VHF antenna SO-239/VHF and GPS antenna TNC female;
Data: RS232 9 way D and IEC 61162 50 way D; Power: 4 pin; NMEA 0183 in

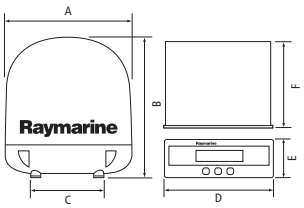
AIS350
Operating voltage: 9.6 – 31.2 v DC
Average power consumption: < 2W
Transmitters type: listen only AIS receiver
Transmitters: None
Receivers: 2

AIS650
Operating voltage: 9.6 – 31.2 v DC
Average power consumption: < 3W
Transmitters type: Class B AIS transceiver
Transmitters: 1
Receivers: 2

VHF Radios and Loudhailer
For VHF radio and Loudhailer specifications, please refer to the table in the this brochure and our website www.raymarine.com

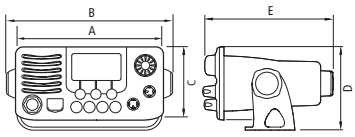
Satellite TV Antennas
Operating voltage: 9 – 30 v DC (all generation 2 models)
Weight kg (lbs): 60STV: 19(41.8); 45STV: 11.6(25.6); 37STV: 9(19.8) 33STV: 4.5(9.9)
Frequency: Ku-Band
Azimuth range: 680°
Antenna gain: 33STV: 31dBi; 37STV: 32dBi; 45STV: 33 dBi; 60STV: 36 dBi
Minimum EIRP: 33STV: 51dBW; 37STV: 50 dBW
45STV: 49 dBW; 60STV: 47 dBW
Elevation: 33STV and 37STV: +10° to 80°
; 45STV: 0° to +90°; 60STV +5° to +90°
Pitch and roll range: roll ±25° / pitch ±15°
Tracking rate: 33STV: 60°/sec; 37STV 60°/sec; 45STV: 50°/sec; 60STV 45°/sec

Note: All specifications are preliminary and subject to change without prior notice.



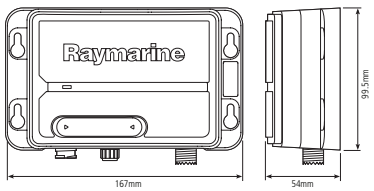
	Antenna (mm)			Control Unit (mm)		
	A	B	C	D	E	F
60STV	698	710	303	177	50	217
45STV	500	530	324	177	50	217
37STV	430	440	141x233	177	50	217
33STV	370	380	144	177	50	217

Satellite TV Antennas and Control Unit



Dimensions (mm)					
	A	B	C	D	E
Ray218E	198	225.5	97.5	112.5	179.3
Ray49E	167	179	73	90.3	175
Ray55E	172.3	191	80	93.8	174

VHF Radios



AIS350/AIS650

PART NUMBERS

AIS
E70050 AIS950 Class A AIS Receiver and Transmitter
E32158 AIS650 Class B AIS Transceiver
E32157 AIS350 Class B Dual Channel Receiver

VHF Radios
E43032 Ray218 (US)
E43033 Ray218E (Europe/RoW)
E43033-UK Ray218E (UK)
E43033-DE Ray218E (Germany)
E43033-DK Ray218E (Denmark)
E43034 Ray49 (US)
E43035 Ray49E (Europe/RoW)
E43035-UK Ray49E (UK)
E43035-DE Ray49E (Germany)
E43035-DK Ray49E (Denmark)
E43036 Ray55 (US)
E43037 Ray55E (Europe/RoW)
E43037-UK Ray55E (UK)
E43037-DE Ray55E (Germany)
E43037-DK Ray55E (Denmark)
A46052 RayMic second station (10m cable)

Voyage Planner
E112116 Voyage Planner WEB Download
E112115 Voyage Planner Boxed Product

Satellite TV Antennas
E93008-2 60STV EU, S. America Sky, M. East Gen 2 Antenna System
E93009-2 60STV DTV Latin America Gen 2 Antenna System
E93011-2 60STV China and New Zealand Gen 2 Antenna System
E93014-2 60STV N. America HD Gen 2 Antenna System
E42194-2 60STV Australia Gen 2 Antenna System
E93003-2 45STV EU, N & S America Sky, Russia and M.East Gen 2 Ant. Sys.
E93004-2 45STV China and New Zealand Gen 2 Antenna System
E93013-2 45STV N. American HD Gen 2 Antenna System
E42219-2 45STV DTV Latin American Gen 2 Antenna System
E42193-2 45STV DTV Australia Gen 2 -Antenna System
E70151 45STV DTV Autoskew M. East and Europe
E70152 45STV DTV Autoskew Brasil
E93017-2 37STV N. American and Russia HD Gen 2 Antenna System
E93018-2 37STV EU Gen 2 Antenna System
E42128-2 37STV China and New Zealand Gen 2 Antenna System
E42192-2 37STV Australia Gen 2 Antenna System
E42171 33STV EU version
E42170 33STV N. America and Russia
E42220 33STV New Zealand

3 FREE WARRANTY UPGRADE FROM 2 YEARS TO 3 YEARS

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